

In This Issue—*Shop Forms That Simplify Flat Rate*

MOTOR AGE

Vol. XLIV
Number 14

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CHICAGO, OCTOBER 4, 1923

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Three Dollars a Year

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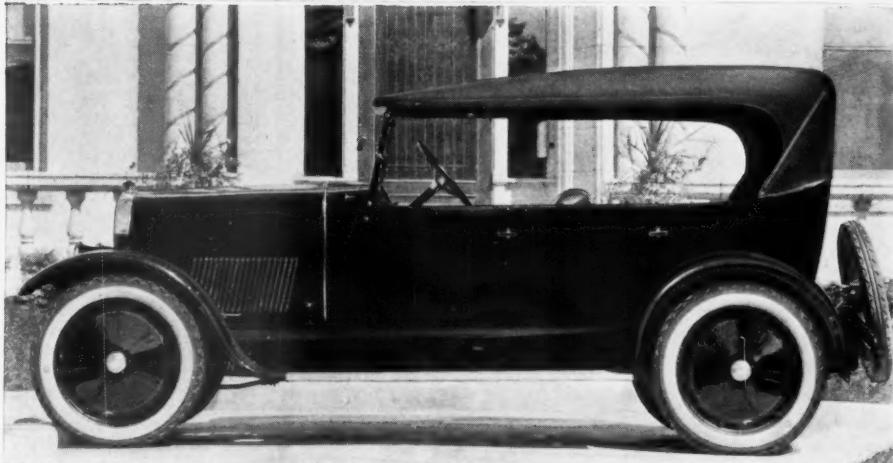
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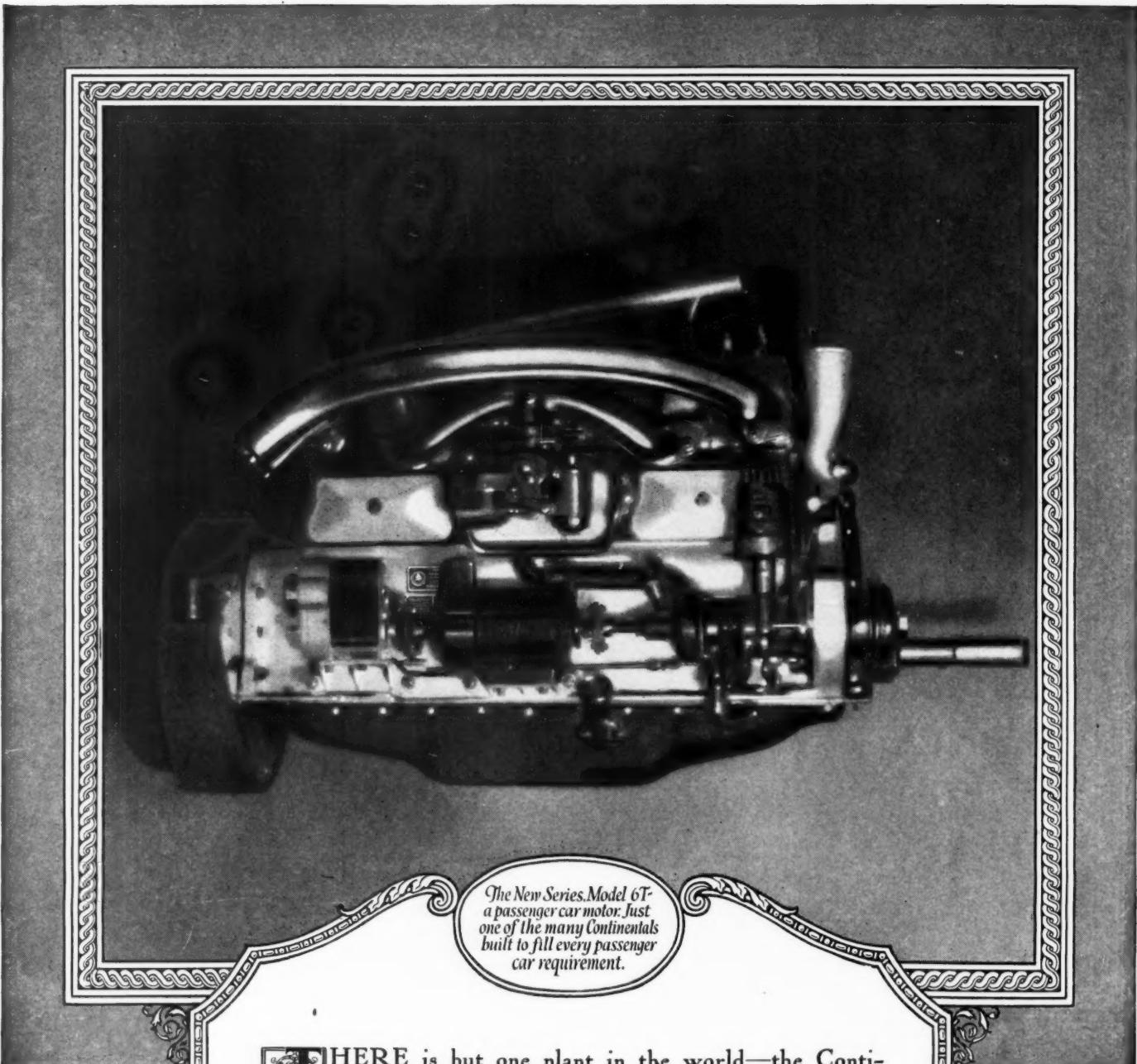


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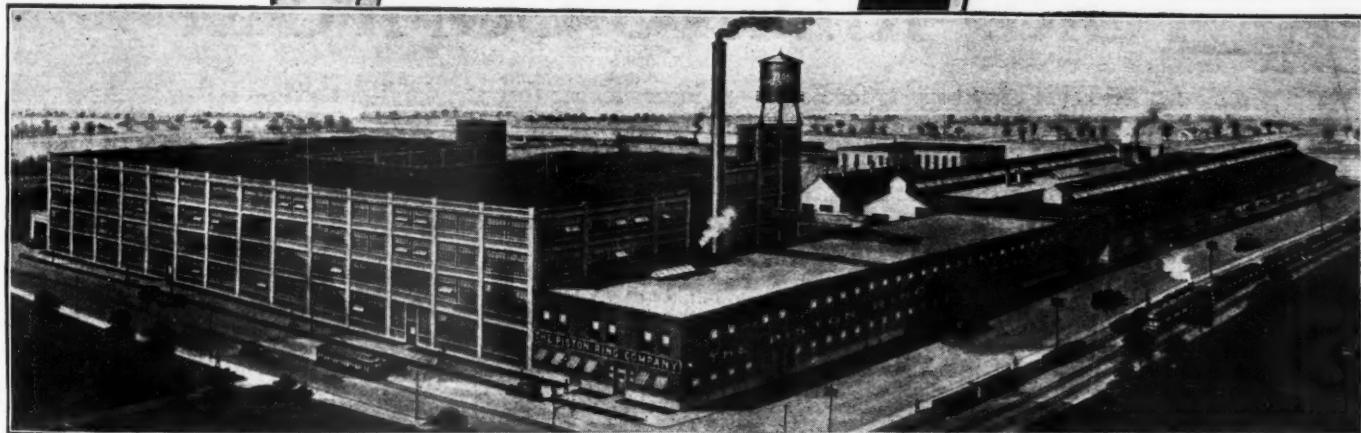
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The *Trainor "45"* offers dealers and jobbers an opportunity to profitably merchandise an item that competition has been making less profitable each year. It will be sold only through recognized automotive jobbers. Dealers should write for the name of our nearest jobber. Jobbers should write at once for our distributing proposition.

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NEW CASTLE, IND.



"The Trainor Way", an improved method of handling replacement springs, is making more money for jobbers everywhere. Write for it!

MOTOR AGE

Reg. U. S. Pat. Off.
Published Every Thursday by

THE CLASS JOURNAL COMPANY

MALLERS BUILDING
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know you are selling
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It signifies mutual interest.

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"Best in the Long Run"

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If you were a piano dealer, would you consider it good business to handle nothing but "baby grands"?

If you were in the furniture business, would you specialize on kitchen tables?

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If you sold adding machines would you expect the banker to buy a small, hand-operated model?

If you can say "no" to all these "ifs" you ought to be selling Studebaker cars.

If you were, you wouldn't suffer the discouragements that follow the loss of sales that you could make if you only had a car to suit every buyer.

If you were selling Studebakers you wouldn't need talk against yourself in switching a prospect from one model to another, of more cylinders or fewer cylinders, because Studebaker builds nothing but Sixes.

If you were a Studebaker salesman you would have three dominating Sixes in twelve body types, ranging in price from \$975 to \$2750 and, in seating capacity, from two to seven passengers. In other words, anyone who is in the market for a car is a Studebaker prospect.

If you are dissatisfied with the handicap under which you have been working because of the limitations of your present line, the local Studebaker dealer may offer you a real opportunity.

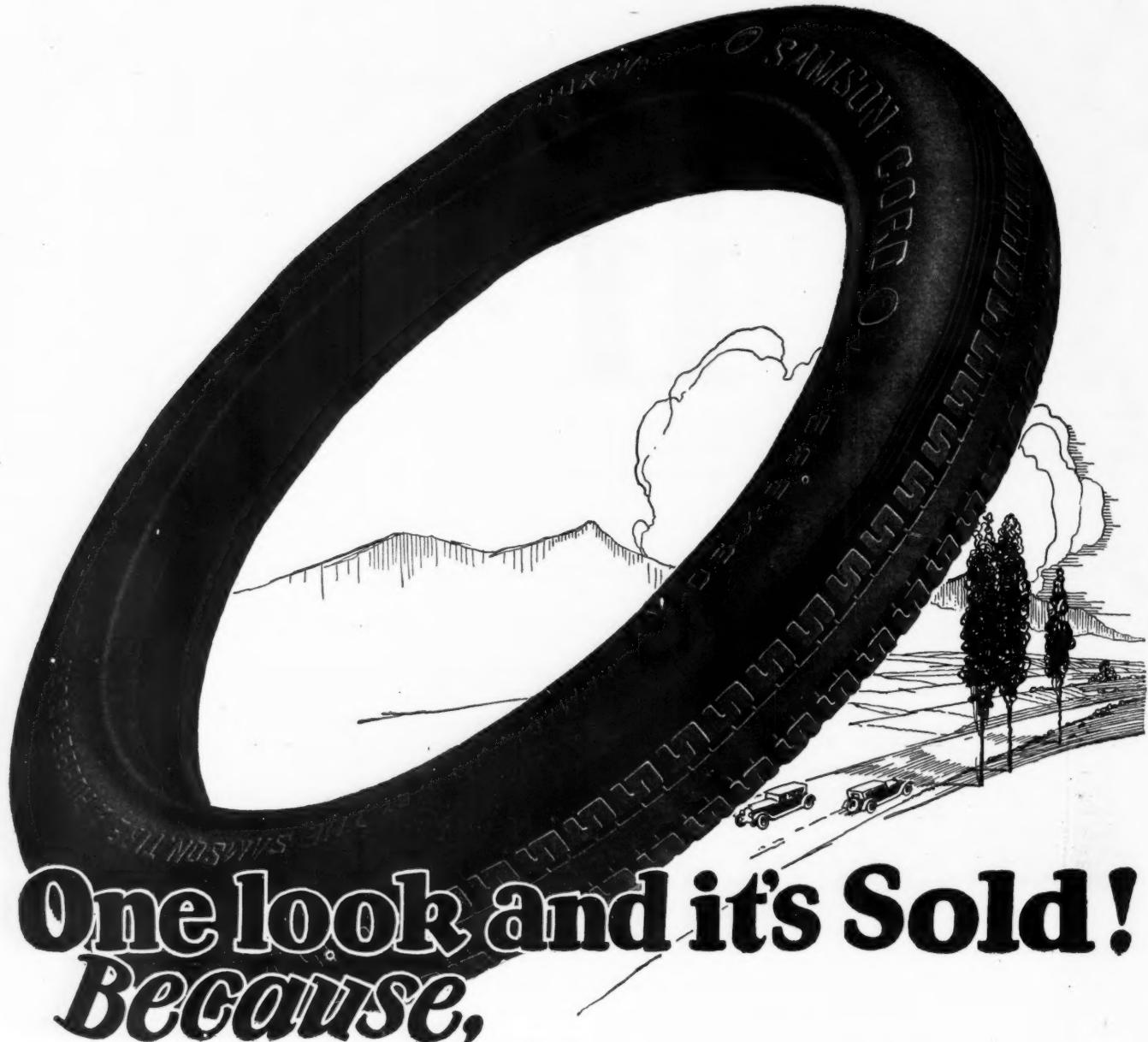
Why not get out of the rut?

1924 MODELS AND PRICES—*f. o. b. factory*

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5-Pass., 112" W. B., 40 H. P.		5-Pass., 119" W. B., 50 H. P.		7-Pass., 127" W. B., 60 H. P.	
Touring	\$995	Touring	\$1350	Touring	\$1750
Roadster (3-Pass.)	975	Roadster (2-Pass.)	1325	Speedster (5-Pass.)	1835
Coupe-Roadster (2-Pass.)	1225	Coupe (5-Pass.)	1975	Coupe (5-Pass.)	2550
Sedan	1550	Sedan	2050	Sedan	2750

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South Bend, Indiana

Studebaker



One look and it's Sold! *Because,*

Next to his confidence in you, your customer is influenced more by the appearance of a tire than by any other single factor. One glance at the super-size, massive treaded, jet black Samson Cord and he's satisfied that quality as well as beauty is built into it.

Whisper that the price is no higher than that of other good tires and the sale's made.

Samson Cords are backed by a franchise that can be secured only by reputable dealers---write for our proposition.

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SAMSON CORDS

MARMON

Reduced to **\$2785**



The fact that the Marmon now sells for \$2785 needs no comment.

The Marmon organization has always had one aim—to place in the hands of the owner a piece of mechanism which would render the lowest operating and maintenance costs for a given standard of comfort and performance.

Marmon has never strayed from this original purpose. Nine years of unrelenting concentration on one type have produced a car which beyond all doubt delivers the finest transportation at the lowest cost per mile.

The growing success of Marmon which has been so apparent for more than a year made it inevitable that the Marmon could be made an even finer car and sell at an even lower price.

The lowest priced car to operate and maintain now becomes the lowest in first cost, in its quality class.

No greater motor car and surely no greater value were ever offered to the motor car investors of America.

New prices effective September 24, 1923. Seven-Passenger Phaeton \$2785,
(former price \$3185) f. o. b. factory; government tax additional.
Corresponding reductions on all other models.

FOUR-WHEEL BRAKES

Optional Equipment at Moderate Additional Cost

It is characteristic of Marmon engineering that the four-wheel brakes now available on the Marmon should follow a design of the utmost simplicity. In producing brakes of tremendous power and safety Marmon engineers have avoided with unusual success, the complications common to many types.

NORDYKE & MARMON COMPANY, Established 1851

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WATER JACKETS AND STEAM AND HOT WATER HEATING SYSTEMS



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SOLD YEARLY

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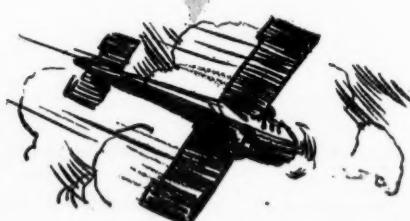
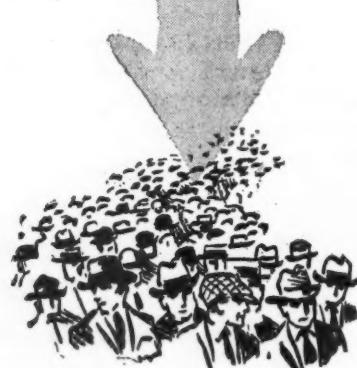
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has been used in the Automobiles and Trucks of the United States Government, Standard Oil, General Electric, American Telephone and Telegraph, etc., and by 30,000 Steamfitters for repairing Leaks in Hundreds of Thousands of jobs every year without shutting down.

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to Repair Cracked Steel Water Jacket of U. S. Navy Seaplane N. C. 4 when forced down in Portugal on its trans-Atlantic flight May 16-27, 1919, and carried ready for emergency by the U. S. Army Aeroplane T. 2 on its Ocean-to-Ocean Non Stop flight, May 3, 1923.



MOTOR AGE

Good Fall and Winter, Fine Spring Trade Say Automobile Factory Presidents

*Executives in Letters to MOTOR AGE See Good General
Business Conditions and Automotive Prosperity*

*Price Reductions and New Models May Cause Momentary Confusion and Hesitation on Part of
Buyers, but Buying Ability and Inclination Exists*

ONLY the brightest prospects are before the automobile dealers for the fall and winter.

The spring of 1924 should bring even a greater movement in automobiles than in 1923.

So say a representative number of presidents of automobile manufacturing companies.

This optimistic view of the dealer's future is plainly stated in letters to MOTOR AGE from these factory executives. The letters are in answer to an inquiry sent to them by MOTOR AGE, asking this information on behalf of the dealers of the country. A copy of the letter of inquiry is printed on this page.

A surprising feature of this correspondence is the proportion of presidents who did not seek this opportunity for mere boom publicity. Such a large proportion asked that the letters be treated as confidential that all are printed without names.

One extremely interesting point made in one of the letters is why the pessimistic opinions held early in 1923 did not materialize. One of the executives says that he was then doubtful of the future because he feared high prices of raw materials and necessary advance in prices of finished products. This, he said, did not materialize, thanks to the foresight of manufacturers who refused to bid against each other for raw materials.

Letter to Factory Presidents

JUST as we are drawing to the close of the best spring and summer the automotive merchants have ever had, we find that a good many of them are thinking more concerning the future than ever before.

You will recall that at the beginning of this year there were many predictions by automotive market students for a big six months and then a question as to the rest of the year.

Now we have passed the six months and are continuing the high rate of production, and this has left the dealers wondering.

Practically every dealer I meet has a question in his mind as to the future. We would like very much to answer that question.

This letter is going to the presidents of the chief automobile manufacturing companies and its object is to ask what, in your opinion, is the prospect for the fall and winter for the automotive merchant.

We are optimistic on the prospects for the coming season and would like to know if you support us in this optimistic view.

It is not our intention to quote any executive unless he so desires. If you will give us your opinion we will treat it confidentially if you so request. What we want is a consensus of honest opinion—not merely prosperity publicity notes.

This foresight and determination on the part of the manufacturer has averted a repetition of the 1920 situation when prices on everything, automobiles included, soared to the point that brought the buyers' strike with its serious consequences.

These letters are evidence that manufacturers are human and that they have the same differences of opinion as to methods as have dealers—that some of them believe in new models and some do not. This is exactly the same difference of opinion that exists among dealers.

This, we believe, adds importance to the unanimity of opinion among the leaders in the industry that the prospect for late 1923 and early 1924 business is good.

Manufacturing executives have opportunity for a broad outlook. They have time to make the study, for it is part of their business. As aides in this study they have special expert observers and many business reports. But more important than these, they have the opinions of their dealer organizations.

It is hardly conceivable that any of these executives would be as optimistic as they are, if their dealer organizations did not, in the main, hold optimistic views.

So we must conclude that the dealers of this country see bright prospects ahead of them.

The arrangement of the letters is roughly from the higher price class to the lower.

There are so many good points in these letters that no effort has been made to present a comprehensive review in this introduction. There is a wealth of education for the dealer in studying them. The letters in whole, or in part, follow:

Problem of Models

AS far as this company is concerned we enjoyed a very nice business in the first six months of 1923, but since the beginning of July we have found it difficult to maintain that volume.

I am naturally optimistic, but I agree with you that there is no need to be optimistic or over optimistic when you have a real job before you.

My own personal opinion is that many of the manufacturers have more or less brought about an unstabilized condition by bringing out new models with new features such as four-wheel brakes, and attempting to advertise them in such a way as to stimulate sales. These features together with recent price reductions by some manufacturers have, in my opinion, put the buying public in a frame of mind that they do not know what is going to happen any day, thereby resulting in a more difficult proposition to put over the sales.

It is also my opinion that more real sales ability is required to make sales today than at any time in the history of the industry, certainly as compared to the spring months of this year.

I believe we will have a fairly good business during the remaining months of this year; this statement, however, is largely dependent on the industry as a whole becoming stabilized insofar as it possibly can.

Buyers Unsettled

MANY manufacturers in the great struggle for domination are waging a war which is destined to eliminate ultimately, I believe, many of the smaller, weaker units, which cannot possibly withstand the keenest of competition.

It does seem that some of the price reductions are made, not for economic reasons, but simply to under-cut competition in a manner that is hardly based on the cost of doing business.

Of course, price is wholly dependent on volume, but in many instances, the volume has not been increased sufficiently to warrant reduction in price.

Undoubtedly, many manufacturers are figuring if they can simply break even, and by this process eliminate competition, they will ultimately benefit by the present action, and be able later on to proceed on a more profitable basis.

To my way of thinking, there is entirely too much turmoil in the merchandising of motor cars—too much to unstabilize market continually and keep the dealer and public guessing.

I also believe that an effort to get too large production is being made, too many manufacturers trying to "hog it all", heedless of the fact that others are trying to do the same thing.

For our own part, we are trying to proceed along sound and natural lines, without forcing in any way, shape or form.

Business during the remainder of the year should be good, but if manufacturers continue this price slashing, I am afraid that the public will react unfavorably toward it, and many manufacturers will not enjoy the prosperity which would be theirs if they proceeded along more fundamental lines.

The used car problem also looms very big, and with uneconomic trading allowances injecting another complication, there is no doubt in my mind but that the industry is rapidly proceeding toward a period of reckoning that could otherwise be avoided.

My attitude is not at all pessimistic, for we ourselves are enjoying the best business we have had in years, but at times it does make it rather difficult to know just what to do in adhering to strictly fundamental principles in the face of what is so palpably the work of opportunists, in attempting to force conditions.

Value is Key

FIRST, I believe the general business is going to be good for this fall and winter. Second, the automobile business will be good, especially with those concerns offering best value for the money. Naturally, with our improved models we are con-

fident about our own business, but I believe others will also enjoy very good winter business.

Dealers Optimistic

OUR dealers are optimistic as to fall and winter business. Personally, I think the general business situation is uncertain. However, I am hopeful.

Dealer Consideration

WE have given a lot of thought to the sales possibilities of motor cars for the future and especially for cars in our price class during the remainder of this year and for 1924.

While optimistic and especially for the sale of our cars, I believe that this fall and winter will see evidence of over-production with certain makes of automobiles, especially among the lower price cars. There has been a tendency on the part of some manufacturers to crowd production, and to crowd production for their advantage without proper consideration of the effect upon their dealer organizations and the rapidity with which the cars are absorbed by the buying public. This is an unhealthy condition and any manufacturer who undertakes to force shipments on dealers in excess of what the retail buying public are prepared to absorb is in my opinion seriously jeopardizing their best interests. I think it a much saner and better business policy all around for manufacturers to watch, as we do, the actual retail sales. A car is not actually sold until it is in the hands of the user.

Grows Every Year

I HAVE been in the automobile business for seventeen years and there has not been a single year in which the demand for motor cars did not exceed the demand of previous years.

The production in each successive year has increased, except during certain years of the war.

The sales of automobiles next year will be larger than during the present year.

Of course, I cannot tell you whether this increased business will be shared by all makers, but the total volume will increase.

Generally speaking, every year is just like every other year in the automobile business and every other line of business from the standpoint of the man who works and plans ahead.

Good Fall Business

PROPHECY is always a very dangerous venture, but we feel quite sincerely that there should be excellent business during the remainder of 1923.

The apparent settlement of the coal strike and the growing belief that the Ruhr problem is nearing solution all point to an increasingly stable condition.

We are confident that business will be good.

Manufacturers Helped

ANSWERING your letter, will state that we have conclusive evidence that the most of us were wrong at the beginning of 1923 in our predictions as to the latter half of the year.

I remember very well that the thing that influenced my opinion was the feeling that there would be an over-inflation of prices on materials. It is very interesting to know that the wiser minds of the country in the financial and manufacturing end of our national affairs used every influence within their power to maintain staple prices. In my judgment, this is what had a stimulating effect on the latter half of 1923.

My personal opinion now is that I can see nothing in the future that looks disturbing, and if nothing of an unusual nature happens, I believe we are bound to have a very good fall and winter business and a splendid business in the spring of 1924.

Answer in Product

REPLYING to your favor, it seems to me that general conditions are such that automobile merchants in general ought to have a fair fall and winter business. It seems to me that our dealers should have an exceptionally good fall and winter business.

I think the time has come when the difference in products turned out by the different companies, spells largely the answer as to the amount of business their particular dealers will enjoy.

Pushing Too Hard

NO doubt the announcement of the 1924 models will create a good business for the fall season, but frankly, I am very much afraid that the manufacturers who are trying too strenuously to increase production will overdo the thing.

If they could just keep a few less cars in the warehouse and a few less on the dealers' floors the condition would be much healthier for everybody.

Organization is Important

WE have naturally often discussed the question you ask, that is, what will be the market for the balance of the year and for 1924.

Our distributing organizations are all optimistic of at least fair business during the coming year and we, with this feeling and reports on general business conditions, feel that 1924 should be as good a year as 1923.

Regarding the prospects for the automotive merchant it is our experience that a distributor having a well supervised organization, working intensively all seasons of the year, is always able, no matter what the general business conditions are, to make his business profitable.

Prospect List Long

REPLYING to your letter, it would of course, be foolish to attempt to predict with any certainty what the coming year may bring about in a business way, but the underlying conditions all point to a continuance of the prosperity of this year.

Foreign conditions appear to be steadily improving. Our own foreign sales this year have been on the increase and show up surprisingly well in total as the year draws to a close. The importance of the foreign market is bound to be reflected generally in the domestic market.

Relief for the farmer, who has suffered a great deal during the past few years, is steadily improving farm conditions, and yet the farm market has by no means reached its peak of normal absorption. With the farm market improving and general world conditions improving, industrial conditions logically will continue to improve.

Wages are at a high level and practically every family has an opportunity today for a much larger amount of leisure than they formerly had with means in their pocket to gratify their desires.

The development of the automobile, which has brought about more rapid transportation, has contributed largely not only to the total number of hours of leisure which America has but

also has proved to be the most universally desired method of recreation sought to occupy that leisure time. This, I think, practically explains the tremendous and increasing demand for automobiles. They not only increase the efficiency of all mankind, but they give the ideal means of enjoying the leisure which this added efficiency provides.

I do not think there is any question but that there will be operating in the United States more than twenty million automobiles as a standard transportation equipment of the country. And it is a notable thing that in foreign countries, even where the buying power is low, when road conditions permit the automobile becomes rapidly a popular means of locomotion. I do not believe we have scratched the surface of the possibilities of the expansion of the automobile in foreign countries. The tremendous lead which the United States has in the manufacture of automobiles in quantities at low cost should provide a steadily expanding outlet for American automobile production and make a contribution which should increase for a long time to come to the industrial expansion of this country.

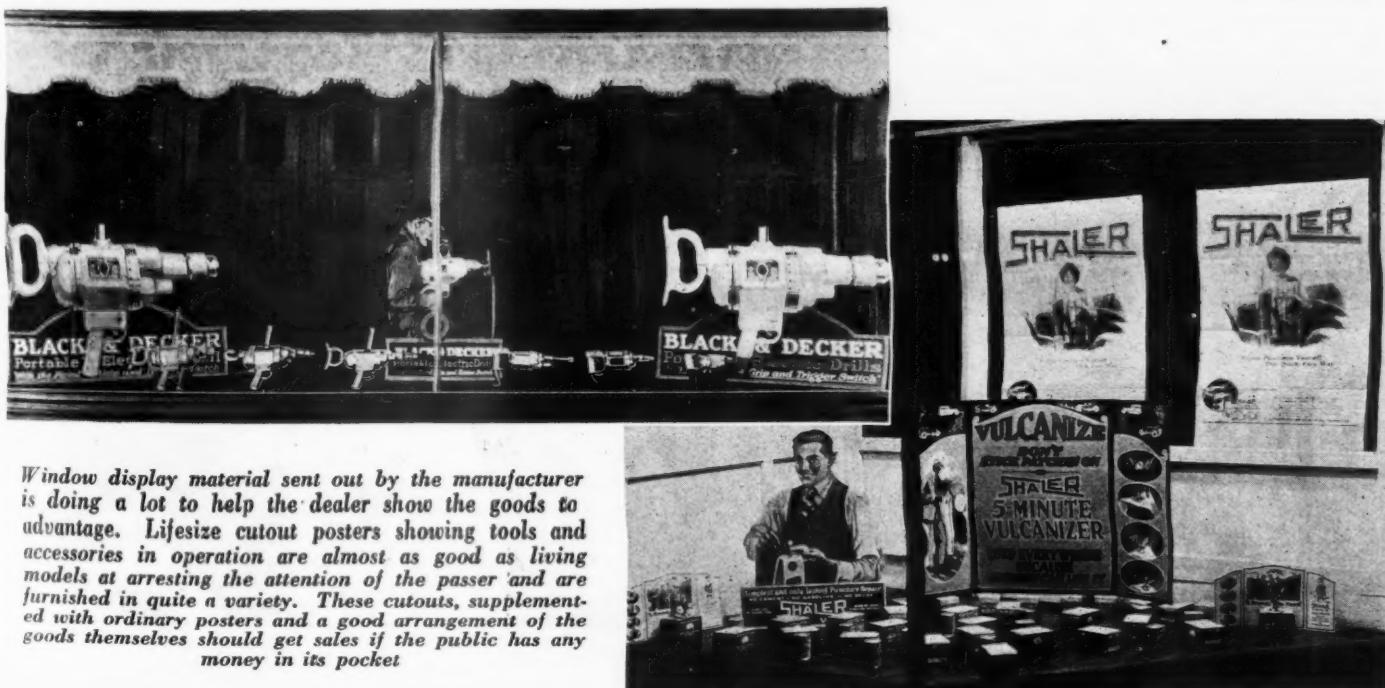
General Prospect Good

ISHOULD think it almost impossible to forecast with any degree of intelligence the actual public demand during this fall and winter in view of the rapidity with which the situation seems to be changing. There is no doubt on earth from a fundamental standpoint but what the fall and winter business should be good and personally I support your optimistic views 100 per cent.

While it is true the foreign situation is not encouraging, it does look better, and while the agricultural regions in the middle west and north are not flourishing, they are not so bad off as they think they are. The credit structure is splendid and there is no real reason why business for the next twelve months should not be good.

On the other hand, you must remember that automobile production has been very great for the past two years, and with the unsettled condition of the price market—some large manufacturers cutting, others advancing and still others standing pat—the public is a little demoralized and it will take them a short time to get their feet back on the ground and begin buying again with confidence. Just how long this will take will have a very direct bearing on fall sales in my opinion.

I believe that while there will be a seasonal slow-up in both production and sales, that the larger and more established companies will have a very good fall and winter business. The smaller companies will not find the road so easy.



Window display material sent out by the manufacturer is doing a lot to help the dealer show the goods to advantage. Lifesize cutout posters showing tools and accessories in operation are almost as good as living models at arresting the attention of the passer-by and are furnished in quite variety. These cutouts, supplemented with ordinary posters and a good arrangement of the goods themselves should get sales if the public has any money in its pocket.

Overland Enclosed Model, The Champion, \$695

Novel Construction of Body Permits of Several Interior Arrangements For Various Purposes. All Seats Demountable. Body Mounted on Model 91 Chassis

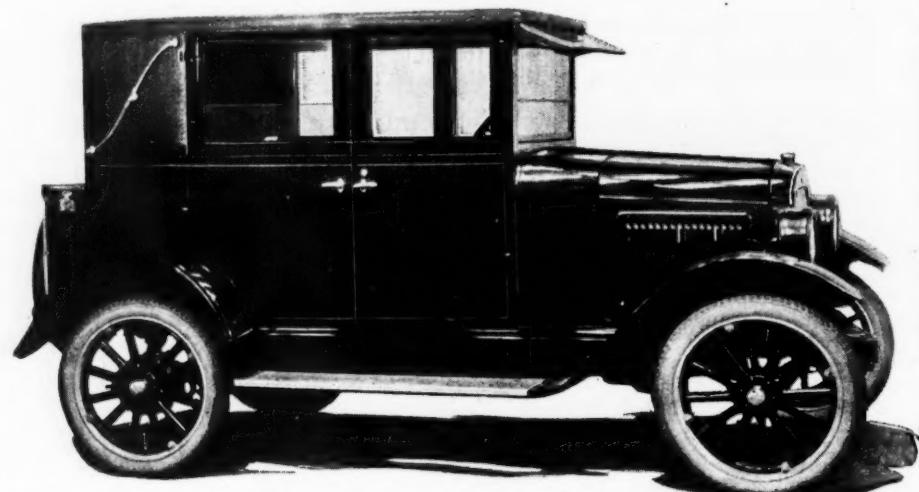
SIMPLIFIED construction and a considerable range of adaptation are features of the latest Overland enclosed car, styled The Champion and selling at \$695. A three door arrangement similar to that of the larger Willys-Knight coupe-sedan is combined with a system of quick detachable seats, seat backs and seat boxes which permits several interior arrangements for various purposes. The body is mounted on the standard Overland 91 chassis of 100 in. wheelbase.

Doors 24 in. wide are located at each side of the front seat while one rear door 27 in. wide is installed at the right side. The rear door swings backward while the front doors swing forward. Each of the doors is carried by three hinges. The two doors on the right side are locked at a common metal covered pillar which is fitted with rubber bumpers, pilot wedge grooves and latches. Windows in the front doors are 19½ in. wide. The window in the rear door is 23½ in. wide while the opposite window in the left side of the body is 27½ in. wide.

Straight Line Design

Severe straight lines are used throughout the entire construction of the body. The only departure from this construction is found in the contour of the top which is curved slightly in both directions. Two intermediate cross members and the front and rear frames of the body support the padded leather fabric top. The exterior construction of the body is all steel which is finished in black paint to the belt line. The rear quarter panels and the back, above the belt, are covered with the same material as the top which is Duratex. Gutters are installed throughout the entire length of the door openings. Nickel-plated imitation carriage bows are located at each rear quarter.

A trunk rack or platform at the back of the body is formed by extensions of



The new Overland enclosed model, known as The Champion. Its simplified construction and range of adaptation are features

the body sills, being completed at the rear by a lateral ½ in. angle iron, which forms the support for the tire carrier. A metal bound trunk, the dimensions of which are 38 in. x 10 in. x 19 in. is bolted to the platform. The lines of the body are parallel from the rear end forward to the rear edges of the front doors, the width in the interior of this section being 40½ in. From the rear of the front doors the body tapers to an interior width of 36½ in. At the dash the interior height is approximately 46 in.

A conventional two piece windshield with a metal visor is used at the front. Windows in the front doors are controlled by lever type regulators while those at the rear are fitted with strap lifts. The left front door is equipped with an exterior lock while the other two are locked from the inside.

The interior of the body, including all

wall surface and the under side of the top, is finished in blue Spanish grain Duratex, with the exception of the portion below the belt line which is covered by the rear seat back. The finishing material is laid over a flush wood lining up to the belt line in order to prevent damage when the car is used for delivery or similar purposes.

Demountable Seat Arrangement

Each of the two full width seats is made up of three parts, namely, seat back, seat cushion and seat pedestal. None of these components is permanently fastened to the interior of the body. The front seat pedestal is hooked into the floor boards by strap iron hooks which are fastened to the heel board, one at each end. Three slots are punched in the mating stamped steel pieces which are screwed into the floor to allow three positions of the front seat fore and aft. The rear seat pedestal is located in a similar manner.

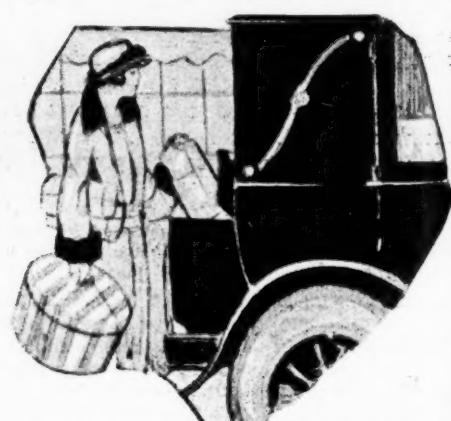
Front and rear seat cushions are located on the pedestals by the usual steel



The body is said to seat five persons in comfort



A Pullman style bed can be made up when the seats are arranged accordingly



The trunk at the rear affords additional carrying space



The seats can be adjusted forward or backward

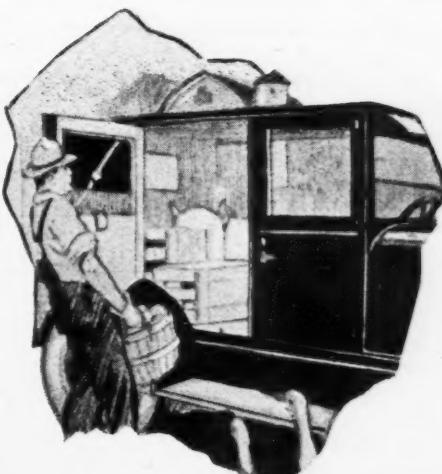
edges which, in the case of the front pedestal, extend entirely around it. Seat backs are made up in separate units. The front seat back is supported at the top by stamped steel hooks which engage with threaded thumb screws that are mounted in the pillars at the rear of the front doors. The lower edge of the front seat back hooks in between the cushion and the rear section of the cushion rail. The angle of the front seat back therefore varies slightly depending upon the fore and aft location of the front seat. The rear seat back is hung by two pins in metal eyelets which are screwed into the rear belt section of the

body and is retained at the bottom by the rear seat cushion.

As the seat facilities are all demountable, the car may be used for a variety of purposes. The component parts of the rear seat may be removed to accommodate parcels or other bulky objects for delivery service. As the back of the body is vertical down to the floor line, all of the space back of the front seat is available for this service. The total



The seats and upholstery can be entirely removed, affording ample space for the salesman's samples, trunks, etc.



The farmer can use the car for hauling produce

volume of the space back of the front seat is approximately 50 cu. ft. Loading and unloading is accomplished through the right rear door.

For camping or similar service, the seat pedestals can be removed and the cushions arranged on the floor to form sleeping quarters. In addition to these characteristics, the three door arrangement makes for convenient access when the car is used purely as a passenger vehicle.

Movie Truck Makes Long Trip

A 2½-ton Gary truck successfully completed the long and tedious mountain journey between Chicago, Illinois, and the Pacific Coast and arrived at Universal City, California, last Thursday with Mr. and Mrs. D. M. Allen and Johnny Conroy aboard.

The towering vehicle served throughout three thousand-mile journey as a unique advertisement for "The Hunchback of Notre Dame," Universal super-Jewel production, starring Lon Chaney. Before leaving Chicago the truck was transformed into a miniature observation car, complete in every detail bearing big placards that proclaimed it to be "The Hunchback of Notre Dame Special."

Herman Stern, assistant sales-manager of the Universal Exchange in Chicago, was responsible for this clever bit of exploitation. He heard that Allen proposed to go to California in a big Gary truck so he got busy and planned the "Hunchback Special" knowing that it would arouse the curiosity of everyone in the many towns along the route. The truck was more than seven weeks on the road, although only twenty days were required for actual running time. More than three hundred towns were startled by the unusual appearance of the big automobile during its remarkable journey. People everywhere began inquiring about "The Hunchback" with keen interest.

Allen had owned the big commercial vehicle for several years, during which time it had served his theatrical transfer business faithfully, so he saw no reason why it could not cross the continent. He talked the proposed journey over with his friend, Conroy, who joined the adventure.

In speaking of the record journey to Mr. Koenig, Allen said: "Our truck stood up wonderfully well and we had no engine trouble of any description. The only mishap on the entire trip occurred in Iowa. Our truck was unable to stay on the sandy road and suddenly lurched over into a ditch. With the help of passing motorists we were able to be on our way in less than an hour.

"We took great pride in answering the thousand and one questions put to us by the residents of the various towns and cities where we stopped over. Everyone was mightily interested in 'The Hunchback.' Mr. Stern is certainly a clever man



William Koenig, assistant business manager of Universal City, and Norman Kerry, Universal star, welcoming "The Hunchback of Notre Dame Special," Gary truck transformed into an observation coach, on the completion of its record run from Chicago, Ill., to Universal City, Calif. From right to left, William Koenig, D. M. Allen, Johnny Conroy, Mrs. D. M. Allen and Norman Kerry

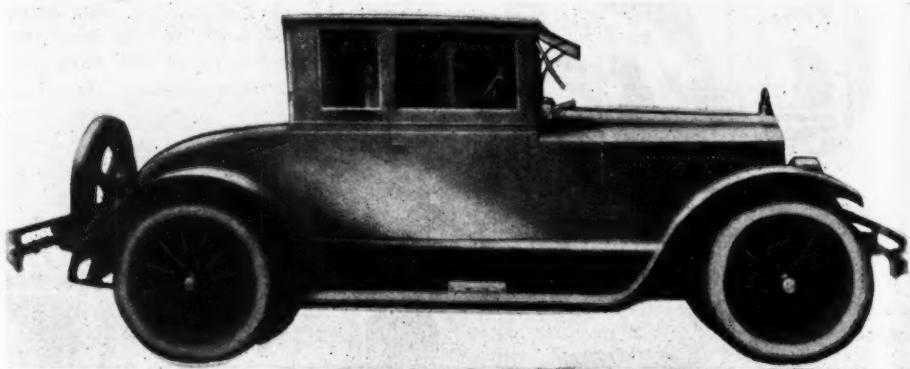
to have thought out such a clever way of telling people about the big picture and we are glad that we are able to successfully complete the trip in behalf of Universal."

Prior to the start of the trip this truck had been operated approximately 30,000 miles, in Chicago, hauling scenery back and forth between large motion picture theatres.

Something New From Car and Truck Manufacturers

New Anderson Two-Passenger Coupe

HERE is shown the new Anderson two-passenger coupe, selling for \$1425 f. o. b. and which was put into production by the Anderson Motor Co., Rock Hill, S. C., Oct. 1. The body is painted a cobalt blue and trimmed in blue Spanish dual-tone leather. The car is completely equipped. It is powered with the Continental 7-U engine.



Swiveling Spotlights Feature Revere Lighting Equipment

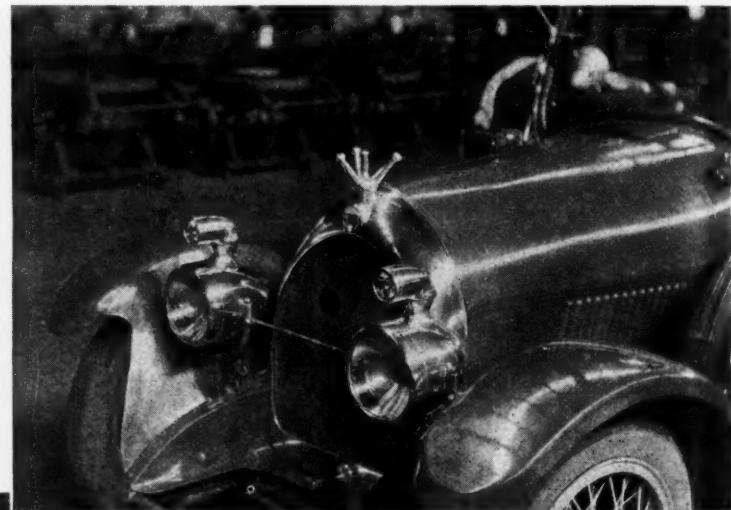
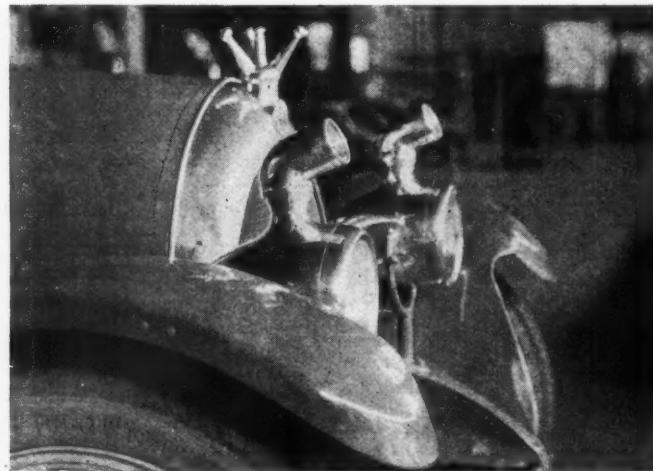
A RATHER novel, but at the same time practical, lighting scheme has been added to the latest model Revere, by the Revere Motors Co., Logansport, Ind. The headlamps are provided with spotlights which can be

swiveled in any direction, this being controlled by the driver.

The lever A is set in a sort of funnel with a ball and swivel. This lever is conveniently placed on the instrument board and the mechanism is so constructed that bringing the lever downwards throws the spotlights upwards and moving the lever upwards throws the light downwards. In the same way swinging the lever to the right or left

causes the lights to be turned to the left and right, respectively.

Naturally these dirigible lights will appeal to tourists and others who seek to spot road signs at night, inasmuch as the lights can be swung at any radius. It is also said that these lights afford excellent means for lighting up the right side of a road when the car passes another vehicle and the headlamps are dimmed or turned out.



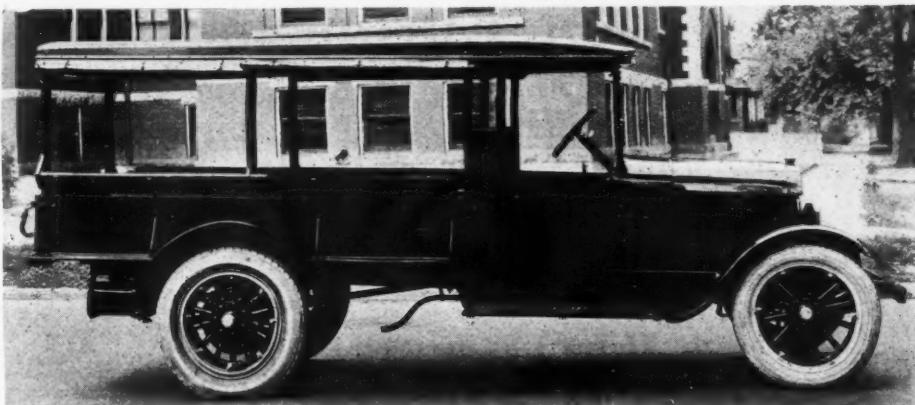
Several Refinements in New Graham Brothers Trucks

COMFORT for the driver and economy for the owner were the two outstanding factors in the design of the new Graham Brothers trucks. The new models are ready for delivery by Dodge Brothers dealers.

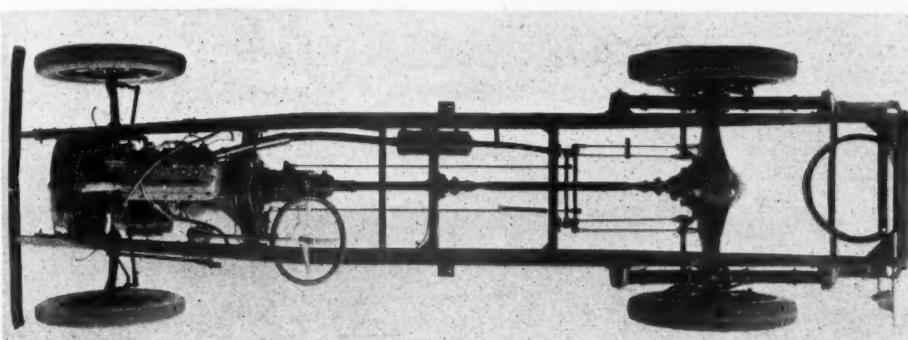
The new frame is stronger and a rigid front bumper is provided. A rear tire carrier is provided below the rear of the frame; this helps one-man operation of the truck, as the tire can be easily lifted on or off this carrier. A new three point suspension of the propeller shaft bearing insures rigid alignment of the shaft.

A change has been made in the location of the battery box which is easily accessible under the left side of the driver's seat.

Both first and second spring leaves are wrapped. In case of breakage of the



The new 1½-ton capacity Graham Brothers canopy truck which is finished in a baked enamel. The tire carrier is at the rear, under the body



Chassis view of the Graham Brothers truck. A three-point suspension of the propeller shaft bearing insures alignment

first leaf, the second carries the load safely until repairs can be made.

Improvements have been made in the cab. The seat cushions have Marshall

springs, are well padded and covered with leather, a high vision windshield permits a comfortable and natural position when driving.

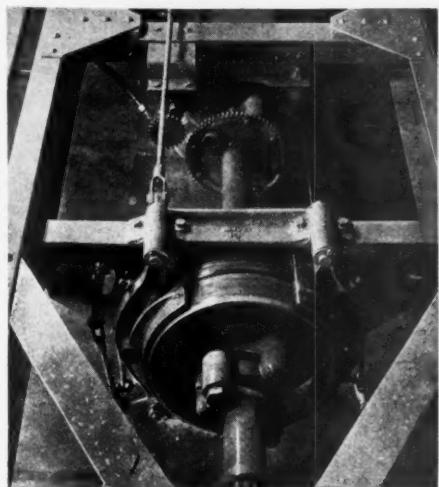
Changes in hood, cowl, lamps and fenders have resulted in a good-appearing truck. The baked enamel finish insures an attractive appearance for a long period of time. All improvements have been made without adding to the weight. No additions in capacity have been made to the line and Graham Brothers continue to specialize in 1 ton-1½ ton trucks, which capacities meet more than 80 per cent of all trucking requirements, it is stated.

Standard bodies, of which there are 26 different designs, have been improved and several new bodies to meet new business conditions have been designed and are in production.

As Graham Brothers trucks are sold and serviced by Dodge Brothers dealers everywhere, the operator is sure of immediate and close-at-hand service wherever the truck may be used.

Menominee Oil Field Special Truck

AMONG the recent developments of the Menominee Motor Truck Co., Clintonville, Wis., is a truck built especially for the oil fields. It is powered by a 4½ by 6 Wisconsin engine, carries two transmissions, the forward one having four speeds forwards and the second, three speeds. The reverse speed is in



A close-up of the propeller shaft brake on the Menominee Oil Field Special

the forward transmission.

The truck has a gear ratio of 102 to 1 on lowest low and .75 to 1 on highest high. The speed ranges from a slow walk on lowest low to 25-30 m.p.h. on highest high. A special double reduc-

tion rear axle with a ratio of 8 2/3 to 1 is used. A propeller shaft shoe brake has also been developed for this truck, which is shown herewith. This has a braking surface 14 in. in diameter and 5 in. wide.



The Menominee Oil Field Special, which is provided with two transmissions, affording wide range of gear changes

Supercharger Engine Outstanding Feature of European Grand Prix

Acceleration of Fiats Big Advantage Over Jimmy Murphy's Miller. Latter Puts Up Fine Exhibition of Driving and Wins Admiration of Italian Crowd. German, Rumpler Designed, Benz Novel in Its Construction and Streamlining

THE triumph of the supercharger engine is the outstanding technical feature of the European Grand Prix race run Sept. 9 on the Monza track and resulting in a victory for Salamano on an eight cylinder Fiat, at an average of 91.03 miles an hour, with his team mate Felice Nazzaro only 24 seconds behind.

Although all the competition was confined to the three Fiats and to Murphy's Miller, the race was never lacking in interest, for Murphy handled his car in a manner which drew forth the admiration of the Italian crowd and the three Fiat drivers fought among themselves as keenly as if they had been members of rival teams.

Bordino's Fiat shot ahead at the outset, followed by Nazzaro and Salamano, with Murphy fourth. These positions never varied for the first forty laps, 248½ miles, by which time Bordino had got a lead of a lap and a half on Murphy, and the other Fiats were one lap ahead of the American driver. Soon after half distance, Bordino made his prearranged stop for fuel and tires.

Bordino Abandons Race

Having been injured in an accident ten days previously, and having no strength in his left arm, Bordino let his mechanician change his two rear tires, and fill the gas and oil tanks, this costing him 5 min. 45 sec. Bordino drove with practically one hand throughout the race, having no grip in his left hand. Gear shifts were made by the mechanician.

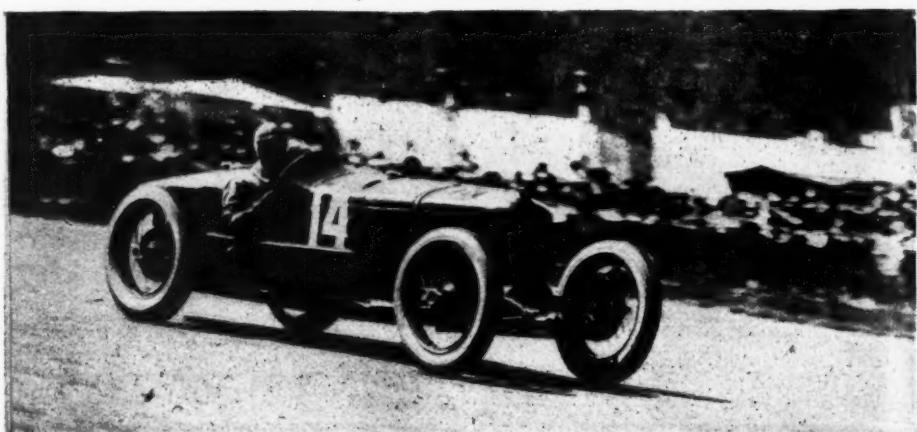
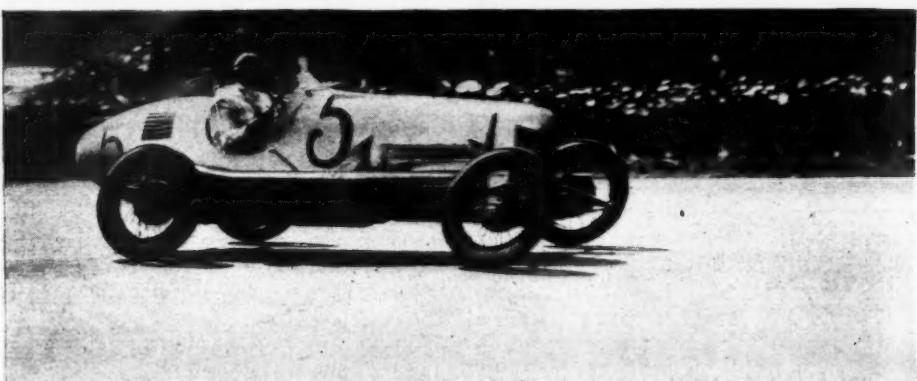
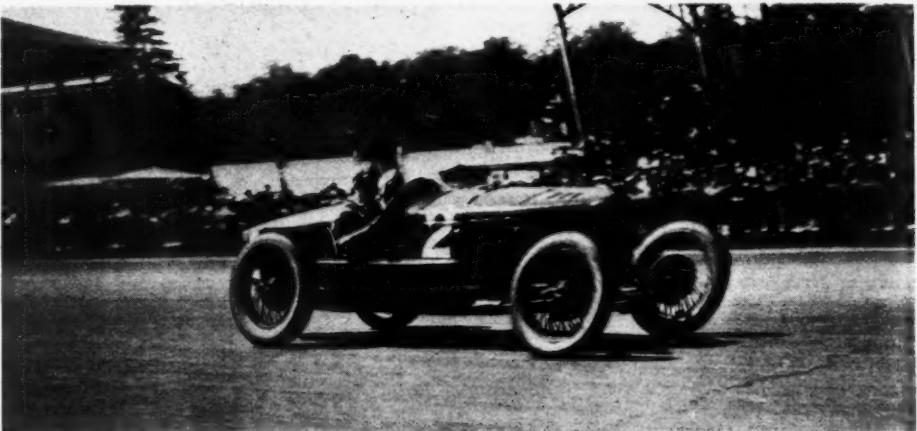
Two laps after his stop Bordino burst a left front tire and the exertion to hold the car caused him so much suffering that he had to abandon the race. No reserve driver being available, the car was withdrawn.

This change put Murphy, who had been running fourth, into third place, and increased his chances, for Nazzaro and Salamano were not as fast as Bordino.

Nazzaro took the precaution of changing his left front tire. Salamano did not do so, and as a consequence he burst on the turn soon after his stop. This put Nazzaro in front and enabled Murphy to close up on Salamano. For five consecutive laps there was a neck and neck race between Nazzaro, Murphy and Salamano, in which Murphy finished by passing Nazzaro on the straightaway, to the wild excitement of the crowd, and Salamano had to stop owing to a burst tire. This gave Murphy no real advantage, for he was still a lap behind the Fiats.

Fiats Neck and Neck

Thirty miles from the end Nazzaro looked like a winner with a margin of one minute when he fractured an oil



Three contenders in the Italian Grand Prix. Top to bottom, Bordino in the Fiat, Murphy in the American Miller and Salamano in the winning Fiat. Bordino had the fastest mount, but owing to his physical condition he was forced to abandon the race

feed pipe and was obliged to stop for a supply of oil. Salamano, who had been gaining ten seconds per lap, closed up on his companion and when the last lap began the two Fiat drivers were neck and neck. Drenched in lubricating oil, Nazzaro had to slacken speed during the last three miles and Salamano crossed

the line with a lead of 24 seconds.

Although he was beaten, Murphy worthily upheld the American colors. He went through the race with only one stop, for tires and gas. Apart from the three Fiats and Murphy's Miller, none of the cars figured from a speed standpoint.

The three Benz cars, built on the Rumpler design, made their first appearance in an open event, and although slower than the Fiats and Murphy's Miller they made a good impression.

The Benz had pleasing lines, with the gas tank in front, the driver and mechanician in the centre and the engine and gearbox at the rear. The radiator was back of the driver, across the car, and surmounted by a pointed water tank. An oil radiator projected on one side.

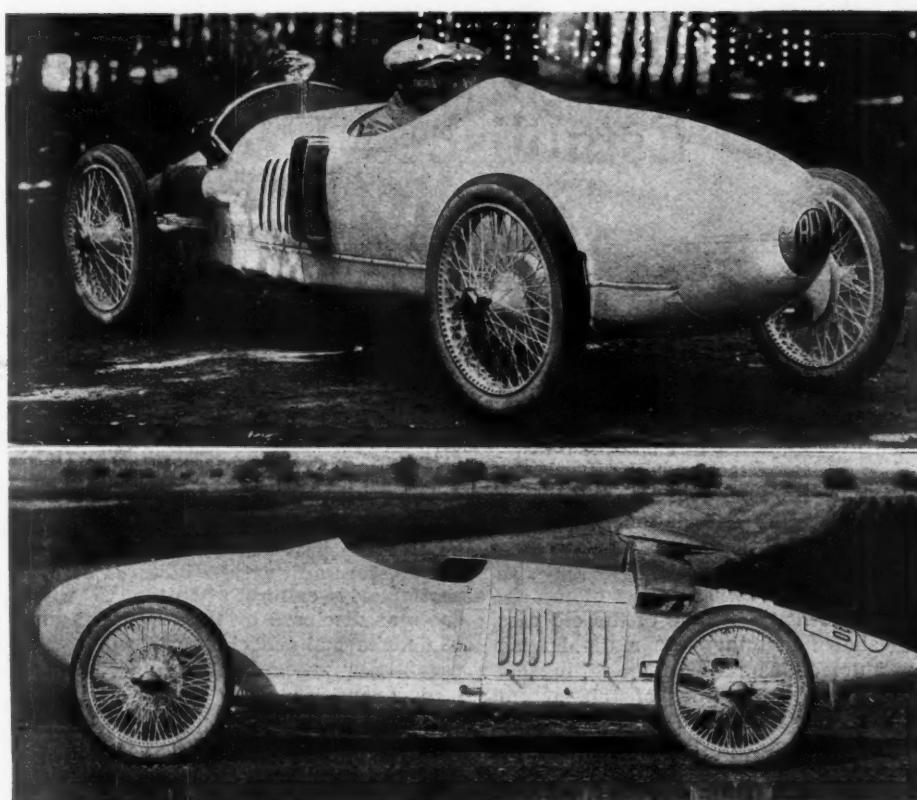
With independent axle shafts, the car gave a very curious impression as it went over the bumps at speed, for the first suggestion as the wheels rose and fell independently of one another was that the axle was going to buckle up on itself. The cars held the track well. The rear end, which is Rumpler's distinctive feature, gave great satisfaction, but the drivers held the opinion that the steering could have been improved.

Benz used a six cylinder engine, the cylinders being separate steel forgings with a separate steel water jacket for each, obviously a war development in aviation engines. Plain bearings were used and, so far as could be judged from an external examination, there was nothing unusual in the design.

Supercharger Chief Factor

Fiat admits that its success was due entirely to the use of the supercharger. Salamano's average of 91.03 miles an hour, for practically 500 miles, is a European record and although not as fast as the average at Indianapolis this is due entirely to track conditions. While one portion of the Monza track is copied after Indianapolis and is slightly faster than the Hoosier Speedway, another part is decidedly slower and calls for the use of gears if the best speed is to be maintained. Acceleration was of the greatest importance, and it was here that the Fiats had an immense advantage over Murphy's Miller.

On the day before the race, Fiat



Close-ups of the Rumpler-designed Benz. This car shows distinctly aircraft practice in the matter of streamlining. The small radiator at the side is for cooling the oil. The fuel tank is in the forward part of the body

changed the final gear ratio to cut car speed down 7 per cent, this being done to avoid any possibility of overspeeding the engine. Despite this Felice Nazzaro set up a record lap at 98.1 miles an hour and later Salamano ran off a lap at 98.9 miles an hour. It is claimed that Bordino, had he been in good physical condition, could have lapped at considerably over 100 miles an hour and that the average for the 500 miles could have been increased by three or four miles an hour.

The Fiats were the lightest cars in the

race, scaling 1569 pounds with tanks empty. The Millers weighed 1615 pounds, and the heaviest were the Voisins weighing 1763 pounds. The Fiats and Murphy and Alzaga's Millers were fitted with a new type Pirelli cord tire. The size in front was 29 by 4 and on the rear 31 by 5, the tread at the rear being perfectly flat.

Murphy took these tires as apparently being more satisfactory for local conditions than anything he had brought over, although the big size put him at a slight disadvantage in the matter of gear ratio.

23 Years Ago This Week In Motor Age

(From MOTOR AGE of Oct. 4, 1900)

Vanderbilt's Fast Trip

NEW YORK, Oct. 1.—William K. Vanderbilt, Jr., arrived here at 11 o'clock last night, having made the journey from Newport in two days in his German Panhard. He had rainy weather and bad roads all the way, but pluckily pushed on to the conclusion of his journey.

Hoffman Steam Vehicle

The Hoffman Bicycle Co. of Cleveland, which has acquired an enviable reputation among the bicycle trade for building nothing but the highest grade of bicycles, has embarked in the automobile business and its chief aim in the new line will be to improve if possible the standard of excellence maintained heretofore in the old . . . The machine is

complete in every detail and has been thoroughly tested before being offered to the public. It is capable of making 35 miles on good roads without replenishing the water or gasoline supply and it will climb a 30 per cent grade either backward or forward. The price with spindle seat is \$750, and with full leather upholstery, full leather top, Victoria style, \$900.

Motor Cars Admitted to Parks

PHILADELPHIA, Oct. 1.—"Everlastingly sticking to it" has brought about the desired result and the Quaker City chauffeur may now roam at will through Fairmount Park without fear of being "called down" by the gray-garbed minions of the law or "hauled up" before a magistrate.

Notes of Interest

Automobiles are proving great attractions at county fairs this fall.

William Jennings Bryan is a convert to the automobile. In Nebraska he has spent some time in traveling from town to town in a horseless carriage—for the purpose, of course, of making speeches at the various stops.

It is reported that Charles E. Duryea will return to his home at Peoria, Ill., to engage in the manufacture of motor vehicles at that place.

The Indianapolis Light & Power Co. is considering plans for charging automobile batteries by placing charging posts at some of the street corners of the Indiana metropolis.

St. Louis Automobile Dealers' Association Establishes Used Car Bureau

Recommend New York Appraisal Plan as Basis of Determining Values

At a meeting of the St. Louis Automobile Dealers' Association last week it was decided definitely to adopt the used car plan submitted by the used car committee and the used car bureau was formed with Robert E. Lee, secretary of the association, as Chairman. Details of the plan follow:

1. That dealers in no case appraise old automobiles with the idea of trading them in until the owners of the old cars have shown that they are really buying new automobiles rather than selling old ones and that in proof of this accept demonstrations in the dealers' new cars before appraisals of their old cars are made.
2. That a used car organization be formed from within the membership of the Dealers' Association.
3. That members of this used car organization be such as agree to carry out the conditions of the association's used car plan.
4. That a member be allowed to participate in the used car organization and derive its benefits only so long as he faithfully fulfills to the letter all of its requirements.
5. That the by-laws be amended to provide for this Used Car Bureau; that the by-laws be something to the following effect:

All dealers, members of the Dealers' Association, who make the required reports of their used car activities to the Secretary's office and otherwise comply with membership requirements of the Used Car Bureau, shall be entitled to membership in such bureau and all of the benefits that may be provided from such membership.

6. That the used car organization hold noon meetings every two weeks.
7. That a permanent chairman be appointed to conduct the used car meetings; that such chairman be selected primarily for his parliamentarian experience and ability, so that he may conduct the meetings with dispatch and without wrangling.
8. That the chairman announce a definite subject for each used car meeting; that there be two speakers designated to talk upon the allotted subject at each meeting, each speaker to be limited to a maximum of ten minutes.

9. That the general character of the subjects shall be such as to educate the members in good used car business practices, having to do, primarily, with methods of appraisal, accounting, over-

head, costs, and the relation of profit and losses to volume and over-allowances.

10. That it be the duty of the clerk handling the used car records in the secretary's office to make a special verbal report at the first meeting following the distribution of the monthly stock report hereinafter provided for, presenting to the meeting an analysis of these stocks, particularly calling attention to weak spots as disclosed by the supply of any one make and model of car which, apparently, may be accumulating in too large quantities.

11. That it be the duty of the same clerk to similarly report verbally on used car sales, particularly drawing attention to both the active and slow moving cars.

12. It is recommended that the office of the Secretary of the Association be used to collect and distribute used car information that if the recommendations of the committee are adopted then an additional clerk be promptly provided to care for the clerical work as suggested, this clerical work to be as follows:

First, all appraisals made by any dealer shall be reported immediately over the telephone to the secretary's office. That such appraisal be recorded on attached form No. 2. The idea back of this is to permit each dealer, when a trade is offered, to call the secretary's office to determine whether or not the car has already been appraised by any other dealer, and if so, at what price. Should the dealer submitting the original appraisal or any other dealer subsequently increase the appraisal value, the secretary's office is to be promptly notified of such increase. In the event of such increase, the secretary's office is immediately to notify the other dealers who have submitted appraisals on this same car. The secretary's office is not to divulge to other dealers the names of dealers who submit appraisal figures.

Second. That a uniform basis for appraisal be adopted and that this be done by the use of appraisal sheet Form No. 1 (or other form as may now be used by a dealer, but providing similar information), also attached.

Third, that each dealer shall report used car sales to the secretary's office daily; that these reports be uniform in the character of the information provided, as called for upon Form No. 3. This provides for information sufficiently complete to give all dealers an intelligent idea of the type and condition of the car involved.

Fourth, a monthly report shall be submitted of unsold used cars on hand, as provided in Form No. 4.

Fifth. The secretary's office shall report monthly the combined sales of all dealers, submitting it to each dealer participating in the plan on Form No. 5.

Sixth. The secretary's office shall similarly report the combined stocks of all dealers on hand at the end of each month on Form No. 6.

Seventh. It is recommended that the plan used by New York dealers for appraising cars, as described in the July 25th issue of Motor World, be used as a basis for determining values. Specifically this is as follows:

"A car is depreciated 25 per cent from the list price as soon as it is sold. This 25 per cent is the selling cost, including the dealer's overhead, direct selling expense and profit. The car is depreciated an additional 2 per cent per month for the first year, 1 per cent per month for the next three years and $\frac{1}{2}$ per cent per month for the next two years, when the car arrives at junk value at the end of six years. In the case of some cars the period can be shortened to four years, or even three or two, if the dealer using the plan desires. Depreciation works out like this on a \$1,000 car:

HOW DEPRECIATION IS FIGURED:

List price	\$1,000
Value after sale—25% (\$250), deducted for selling expense.....	750
Value at end of first year—12 months at 2% per month or 24% (\$240), deducted for use of car.....	510
Value at end of second year—12 months at 1% per month or 12% (\$120), deducted for use of car.....	390
Value at end of third year—12 months at 1% per month, or 12% (\$120), deducted for use of car.....	270
Value at end of fourth year—12 months at 1% per month, or 12% (\$120), deducted for use of car...	150
Value at end of fifth year—12 months at $\frac{1}{2}$ per month, or 6% (\$60), deducted for use of car.....	90
Value at end of sixth year—12 months at $\frac{1}{2}$ per month or 6% (\$60), bringing car to junk value..	30

The foregoing should accomplish this:

First give uniform information as to appraisals made upon any particular used cars as opposed to the owner's statement, which is so often incorrect.

Second, it will keep dealers posted as to how used cars are selling and at what prices, and it will also keep them familiar with not only the aggregate stocks on hand, but the stocks of each particular car.

Flat Rate Requires Less Paper Work

Only Three Forms Are Necessary For the Installation of the Flat Rate System. It Requires Less Bookkeeping and Makes Possible the Cash Payment Plan

By PAUL DUMAS

Preceding articles in this series were published on June 21, July 12, August 2, August 23 and September 13, 1923.

TOO much bookkeeping or "paper work," or too little of it has proved the undoing of more than one promising maintenance firm. Generally speaking the repair business has suffered from too little bookkeeping has suffered a noticeable number of mortalities can be traced to "too much paper work" and too little business.

Before the inception of Flat Rate the tendency was towards extremes, with a certain class of dealers carrying the burden of an accounting system too elaborate to be efficient, and the other great number of dealers who looked on the Ledger and Monthly Statement as the extravagant waste of Time, Paper and Ink. Somewhere in between these extremes there must be a plan of selling repairs that will permit of a more accurate and more simplification of BUSINESS RECORDS.

Bookkeeping, Accounting or whatever you care to call it is nothing more than a system of business records. The function of all business records is to tell the owner of a business enterprise "where he stands today" and what he "May expect in the future." Up to date

the closest approach to a merchandising plan that will permit the "happy medium" in Business Records is the Flat Rate system of selling automobile repairs.

Among the foremost advantages of Flat Rate from a bookkeeping standpoint is the fact that THE OWNER KNOWS WHAT HE IS BUYING AND HOW MUCH HE IS BUYING AND HOW MUCH HE IS PAYING FOR IT BEFORE THE SERVICE IS DELIVERED. This means that the selling of repairs can be placed on a cash basis and when sold for cash the amount of paper work or office labor is materially reduced.

Under the old system the Plumber only was considered more avaricious than the maintenance depot proprietor. Call it Psychology, Human Nature or whatever you believe is a good definition.

With Flat Rate, the compiling of monthly statements and the ITEMIZING and description of repairs sold, requires fewer forms and fewer words. To begin with, repair work sold under the Flat Rate plan is not listed on the records as "Time and Material" but as Repair Sales. However as this has to do with the actual bookkeeping procedure we will not dwell on it further but will consider the forms necessary to actually install Flat Rate.

To the establishments that in the past have adhered to approved bookkeeping method the three forms required will indicate the SIMPLICITY of Flat Rate. For the maintenance dealer who never could see the sense of bookkeeping, the forms will seem useless. Sooner or later this class will find out that a "pants pocket cash register is an expensive investment in the end."

Three Forms Only Needed

They are:

THE INSPECTION REPORT

THE REPAIR ORDER

THE DAILY OPERATION TICKET.

The Inspection Report is not absolutely necessary but it is recommended as an excellent remedy for the ancient custom of "passing the buck." In this respect its value lies in the fact that the dealer can record anything WRONG with the car that should be repaired. If the customer does not care to APPROVE of ALL operations recommended, and later complains of trouble due to some unit that was NOT repaired; the shop is protected by the original copy of the Inspection Report showing that this work was recommended but not approved.

Perhaps the most complete and at the same time compact arrangement of an Inspection Report is the form used by Packard, illustrated at fig. 1. Another and important function of the Inspection Report is that it functions as an AUTHORITY FOR REPAIRS FORM.

The Repair Order

Several arrangements of the Repair Order have been gotten up by the various large service organizations. These forms vary in their degree of completeness but

(Continued on page 23)

Daily Operation Ticket						
Form 2024						
Mech's Name	A. Clark		No. 4			
Date	10/20		1923			
REPAIR ORDER NUMBER	OPERATION NUMBER	TIME STARTED	TIME FINISHED	NET TIME	WORKS BILLED	PRICE
144763	1905	8:05	12:45	4½	shaking	250 PW
"	1901	12:45	12:55	10 M		
"	1902	1:25	2:05	30 M		38 PW
IN A.M. OUT A.M. IN P.M. OUT P.M. TOTAL						
7:25 12:00 12:30						
SEE INSTRUCTIONS ON OTHER SIDE						
4 FOREMAN'S SIGNATURE						

Packard SERVICE INSPECTION REPORT		R. O. 105	
Name	J. A. Baker	Phone No.	777
St. & Address	172 State St	City	Aurora
Date	Dec 1	Year	1923
License No.	288615	Model	1923 S
Motor No.	17725	Del. Date	7/14/
1923		Mileage	9423
Customer's Instructions: Knock on a tree			
Over house			
Stuffy oil in motor			
Gas Pressure			
Pounds			
Oil Pressure			
Pounds			
Ammeter Reading			
15 MPH 11 Amps			
WORK ORDERED			
Did Customer Request a Complete Inspection?		S4-40	
STANDARD GROUPS	Symbol	WORK RECOMMENDED (Be Specific)	STANDARD PRICE
1. Lubrication	L	Change oil, flush out and renew	3.35
C. Cleaning	C		
M 1 Motor General	M 1	Clean carburetor valves, tune motor	12.00
2. Valve and Oper. Parts			
3. Gasoline System			
4. Timing Chain and Gear			
5. Crank Case and Bearings			
6. Cylinder and Pistons			
7. Cooling System			
8. Exhaust System			
T 1 Clutch			
2. Transmission			
3. Universal Joints			
P 1 Brathers			
2. Springs			
3. Brackets			
4. Front Fenders			
S 1 Steering, Connections			
2. Steering, Materials			
3. Steering Gears			
A 1 Brakes			
2. Torque Arm and Radius Rods			
3. Rear Wheels			
4. Differential			
B 1 Rear Fenders			
2. Top			
3. Upholstery			
4. Windshield			
5. Equipment			
6. Body			
E 1 Ignition			
2. Generator			
3. Starter Motor			
4. Lamp			
5. Wires			
6. Horn			
7. Battery			
Form B-101		1	103 King
			INSPECTOR

Flat Rate Schedules—Power Plant—The Clutch

It will be noted that the operations listed for many of the cars incorporate "Overhaul Clutch Assembly." Under average conditions where the exact cause of trouble in this unit cannot be accurately diagnosed, it is advisable to sell Operation No. 20. Operations 35 and 36 are KEY operations and should be used on other work where the repair of another unit necessitates the removal of the clutch assembly. The operation on the Dodge covering "Treatment of Slipping Clutch" can be used to advantage on all cars that are equipped with a "dry disc clutch."

MARMON —Model 34 and Later	
Operation No. 20	OVERHAUL CLUTCH. Includes labor of installing all parts necessary to put clutch in good working order. MATERIAL. Discs. Bearings.
Operation No. B20	REMOVE AND INSPECT CLUTCH in detail. MATERIAL. None. RELINE CLUTCH in conjunction with No. B20 when clutch is removed from car. RELINE CLUTCH as a single or separate operation. MATERIAL. Clutch facings. Rivets.
Operation No. B21	INSTALL CLUTCH RELEASE BEARING in conjunction with No. B20 when clutch is removed from car. MATERIAL. Release bearing.
Operation No. BS21	INSTALL CLUTCH RELEASE BEARING as a single or separate operation. MATERIAL. Same as No. B22.
Operation No. B22	OVERHAUL CLUTCH. Includes relining, installing new release bearing and labor of installing any parts necessary to put clutch in good working order. MATERIAL. Clutch facings. Rivets. Release bearing.
BUICK —Models H to 22	
Operation No. 20	RELINE AND INSPECT CLUTCH in 8 hrs. MATERIAL.
Operation No. B20	RELINE CLUTCH in conjunction with No. B20 when clutch is removed from car. RELINE CLUTCH as a single or separate operation. MATERIAL. Clutch facings. Rivets.
Operation No. B21	INSTALL CLUTCH RELEASE BEARING in conjunction with No. B20 when clutch is removed from car. MATERIAL. Release bearing.
Operation No. BS22	INSTALL CLUTCH RELEASE BEARING as a single or separate operation. MATERIAL. Same as No. B22.
Operation No. 29	OVERHAUL CLUTCH. Includes relining, installing new release bearing and labor of installing any parts necessary to put clutch in good working order. MATERIAL. Clutch facings. Rivets. Release bearing.
REO —Models T6V and F	
Operation No. R34S	RENEW CLUTCH DISCS. MATERIAL necessary is included in total.
Operation No. R24S	INSTALL CLUTCH THRUST BEARING. MATERIAL. Material necessary is included in total.
Operation No. R38	FRT CLUTCH PLATES TO STOP RATTLE. MATERIAL. None.
DODGE —4 Cyl. Models	
Operation No. DS21	RELINE CLUTCH. MATERIAL. Clutch facings. Rivets.
Operation No. 20	OVERHAUL CLUTCH. Includes same as No. 20 on Maxwell or Marmon. MATERIAL. Same as Marmon. INSTALL CLUTCH THROWOUT YOKE.
Operation No. DS22	INSTALL CLUTCH THROWOUT YOKE. MATERIAL. Discs.
HUPMOBILE —Model R	
Operation No. H36	RELINE CLUTCH. MATERIAL. Clutch facings. REMOVE CLUTCH AND TRANSMISSION ASSEMBLY ONLY. MATERIAL. None. INSTALL CLUTCH AND TRANSMISSION ASSEMBLY ONLY. MATERIAL. None. INSTALL CLUTCH RELEASE BEARING. Does not include removing or installing of clutch and transmission assembly. To complete see No. H36 and H35. MATERIAL. Release bearing. INSTALL CLUTCH PLATE, ANTI-RATTLER SPRINGS. To complete see H36 and H35. MATERIAL. Anti-rattler springs. INSTALL OR REPLACE FLYWHEEL CLUTCH DISC STUDS. To complete see H35 and H36. MATERIAL. Studs.
Operation No. H22	RELINE CLUTCH. MATERIAL. Anti-rattler springs. INSTALL OR REPLACE FLYWHEEL CLUTCH DISC STUDS. To complete see H35 and H36. MATERIAL. Studs.
Operation No. 38	FREE PLATES ON STUDS TO RELEASE DRAGGING CLUTCH. MATERIAL. None.
Operation No. 41	LUBRICATE CLUTCH RELEASE BEARING. MATERIAL. None.
CARS under \$55000	
MAXWELL —After Car No. 193801	
Operation No. 20T	OVERHAUL CLUTCH. Includes complete overhaul of clutch assembly OVERHAUL TRANSMISSION in conjunction with No. 20. MATERIAL. REMOVE ONLY Clutch and Transmission Assembly. Includes removal of floor boards, toe board, clutch and brake pedals, disconnect universal joint. MATERIAL. None.
Operation No. 20	OVERHAUL CLUTCH. Includes complete overhaul of clutch assembly OVERHAUL TRANSMISSION in conjunction with No. 20. MATERIAL. REMOVE ONLY Clutch and Transmission Assembly. Includes removal of floor boards, toe board, clutch and brake pedals, disconnect universal joint. MATERIAL. None.
Operation No. 27	OVERHAUL CLUTCH. Includes complete overhaul of clutch assembly OVERHAUL TRANSMISSION in conjunction with No. 20. MATERIAL. REMOVE ONLY Clutch and Transmission Assembly. Includes removal of floor boards, toe board, clutch and brake pedals, disconnect universal joint. MATERIAL. None.
Operation No. MS22	INSTALL CLUTCH SHIFTER YOKE OR RACE. Includes removal and installation of clutch and transmission. MATERIAL. Shifter race or yoke.
Operation No. LS21	RELINE CLUTCH. MATERIAL. Discs.
LINCOLN —All Models	
HUDSON SUPER SIX AND ESSEX	
DODGE —All Models	

HUDSON SUPER SIX AND ESSEX

Operation No. DS21	DODGE —All Models	RELINE CLUTCH MATERIAL Facings, Rivets.	Operation No. 20	OVERHAUL CLUTCH. Includes: Remove clutch, tear down, fit clutch cover and studs to flywheel, replace all worn cork and steel discs that are scored or warped. Replace springs, adjust jaw liners or renew if necessary. Replace and repair all parts necessary to make clutch operate freely. Lubricate.	HUDSON ESSEX	8 hrs.
Operation No. DS22		INSTALL CLUTCH RELEASE FORK (cone style)	4 hrs.			
Operation No. 23		MATERIAL Release fork.	3 hrs.			
Operation No. 24		INSTALL ONE CLUTCH SHAFT (bushed) Cone clutch. Includes the removal and installation of the transmission and clutch assembly as required on Job No. DS21, and in addition remove flywheel.	7 hrs.			
Operation No. 25		MATERIAL 1 clutch shaft, bushed.				
Operation No. 26		INSTALL ONE CLUTCH SHAFT FRONT BEARING. Includes same work as for No. DS21 (disc clutch) and in addition remove the clutch shaft front bearing cork retainer, clutch shaft front bearing oil retainer cork and clutch shaft front bearing washer.	6 1/2 hrs.			
Operation No. 27		MATERIAL 1 clutch shaft front bearing, 1 clutch shaft front bearing washer, 1 clutch shaft front bearing oil retainer cork.				
Operation No. 28		REMOVE CLUTCH SHAFT END PLATE. Includes removal and installation of all parts as in Job No. DS21 and in addition removal and installation of spacing washer.	7 1/2 hrs.			
Operation No. 29		MATERIAL Clutch shaft (front) bearing thrust collar. Clutch shaft (front) bearing thrust washer.				
Operation No. 30		TREAT SLIPPING CLUTCH. Includes washing clutch with gasoline and treat with rosin and turpentine.	1 1/2 hrs.			
NOTE: OPERATION OF REMOVING CLUTCH IS PERFORMED AS FOLLOWS: (Disc type) remove floor boards and clutch hand hole cover. Disconnect foot brake and hand brake pull rods, clutch release bearing tube and speedometer cable. Remove accelerator pedal and bracket. Disconnect and pull rear axle assembly. Remove transmission block and control assembly. Remove bolts, transmission to oil pan and cylinder parts, cleaning and general overhaul. Remove clutch assembly for replacement of parts, cleaning and general overhaul.						
Operation No. OS21	OAKLAND —Models 34H-C-D, 6-44	RELINE CLUTCH. Includes Lining, Rivets.	5 hrs.			
Operation No. OS22		INSTALL NEW CLUTCH COLLAR.	1 hr.			
Operation OS21 to be performed as follows: Raise hood and remove accelerator pedal. 2—Remove floor board and disconnect clutch release bearing lubricator from toe board. 3—Remove lower toe board and front universal joint. 4—Remove hand brake lever and disconnect come back spring and clutch pedal adjusting link. 5—Remove 4 transmission to bell housing screws and take off transmission. 6—Remove clutch release bearing lubricator tube from bearing. 7—Remove 3 mud pan to bell housing screws. 8—Unscrew clutch bell housing to crankcase screws. Remove bell housing. 9—Remove clutch support bearing nut. 10—Remove clutch cone assembly from clutch with chisel. Install lining and re-assembly.						
CHEVROLET —Models 490 and Superior						
Operation No. 42		INSTALL CLUTCH CONE.	3 1/4 hrs.			
Operation No. 43		OVERHAUL CLUTCH ASSEMBLY. Includes same work as Marmont or Maxwell operation.	6 hrs.			
MATERIAL Same as Maxwell or Marmont. REMOVE AND INSTALL CLUTCH ASSEMBLY.						
MATERIAL None.						

PACKARD —Models 116, 126, 133		RENEW CLUTCH CASING PLATES	
Operation No. P34S	2 110165 plate. 2 111480 plate. 3 111485 spider plate. 1 111497 gasket. 1 qt. gear oil.	Model 116 Model 126, 133, after car No. 4026	9 hrs. 9 hrs.
Operation No. P35S	3 No. 110165 4 No. 111485	REMOVE CLUTCH FOR INSPECTION, DISMANTLE AND REPORT. Does not include reassembly.	3½ hrs.
Operation No. P36	MATERIAL None.	REPLACE CLUTCH. Does not include removal of clutch and is used with No. P36S.	4½ hrs.
Operation No. P37	MATERIAL None.	INSTALL CLUTCH SHAFT FRONT BUSHING. To complete see No. P36 and P36S.	1½ hrs.
Operation No. P38	MATERIAL 1 114147 Bushing.	INSTALL CLUTCH SHAFT REAR BEARING (clutch down). To complete see No. P36 and P36S.	2 hrs.
Operation No. P39	MATERIAL 1 sleeve. 1 roller assembly. 1 thrust washer. 1 gasket. 2 quarts gear oil.	INSTALL CLUTCH SHAFT (clutch down). To complete see P36 and P36S.	2 hrs.
Operation No. 28	MATERIAL 1 shaft. 2 gaskets. ADJUST CLUTCH PEDAL. MATERIAL None.	MATERIAL ADJUST CLUTCH. MATERIAL None.	½ hr.
Operation No. 20	MATERIAL Same as Marmon or Maxwell.	OVERHAUL CLUTCH ASSEMBLY. Includes same as No. 20 on Marmon or Maxwell.	7 hrs.
Operation No. 024	MATERIAL Same as Marmon or Maxwell.	INSTALL CLUTCH THRUST BEARING.	6 hrs.
Operation No. 23	MATERIAL 1 clutch shaft.	Clutch thrust bearing.	6 hrs.
Operation No. 028	MATERIAL None.	ADJUST CLUTCH.	¾ hr.
Operation No. 028T	MATERIAL None.	ADJUST CLUTCH THROW.	1 hr.
WILLYS-KNIGHT —Model 20		OVERHAUL CLUTCH ASSEMBLY. Includes same as No. 20 on Marmon or Maxwell.	
Operation No. 20	MATERIAL Same as Maxwell or Marmon.	OVERHAUL CLUTCH ASSEMBLY. Includes same as No. 20 on Marmon or Maxwell.	9 hrs.
Operation No. 24	MATERIAL 1 clutch shaft.	INSTALL CLUTCH SHAFT.	8 hrs.
Operation No. W24	MATERIAL 1 clutch shaft.	INSTALL CLUTCH THRUST BEARING.	8 hrs.
Operation No. W28	MATERIAL 1 thrust bearing.	ADJUST CLUTCH.	1 hr.
None.	MATERIAL None.	ADJUST CLUTCH THROW.	1 hr.
Operation No. W28T	MATERIAL None.	ELIMINATE HEAVY GRINDING IN CLUTCH THROW AND MECHANISM. (Plug (2) two $\frac{1}{4}$ inch holes in rear internal wall of upper crank-case.)	¾ hr.
Operation No. 30	MATERIAL 1 plug. 3 pins oil.	ELIMINATE HEAVY GRINDING IN CLUTCH THROW AND MECHANISM. (Plug (2) two $\frac{1}{4}$ inch holes in rear internal wall of upper crank-case.)	5 hrs.
Operation No. W30	MATERIAL 1 plug. 3 pins oil.	RELINE CLUTCH. Includes relining driven plates only.	5 hrs.
Operation No. PJ21	MATERIAL Facing.	OVERHAUL CLUTCH ASSEMBLY. Includes same as Operation No. 20 Marmon or Maxwell.	5½ hrs.
Operation No. 20	MATERIAL Same.	OVERHAUL CLUTCH ASSEMBLY. Includes same as Operation No. 20 Marmon or Maxwell.	10 hrs.
Operation No. P22B	MATERIAL INSTALL CLUTCH THROWOUT BALL BEARING.	OVERHAUL CLUTCH ASSEMBLY. Includes same as Operation No. 20 Marmon or Maxwell.	11 hrs.
Operation No. JS22	MATERIAL Throwout bearing.	INSTALL CLUTCH THROWOUT BALL BEARING.	4½ hrs.
Operation No. P32	MATERIAL Throwout yoke.	INSTALL FORK FOR CLUTCH THROWOUT.	4¾ hrs.
Operation No. 2	MATERIAL Fork or clutch throwout.	INSTALL FORK FOR CLUTCH THROWOUT.	2 hrs.
OVERLAND —Model 4		OVERHAUL CLUTCH ASSEMBLY. Includes same as No. 20 on Marmon or Maxwell.	
Operation No. 20	MATERIAL Same as Marmon or Maxwell.	OVERHAUL CLUTCH ASSEMBLY. Includes same as No. 20 on Marmon or Maxwell.	7 hrs.
Operation No. 024	MATERIAL Clutch thrust bearing.	INSTALL CLUTCH SHAFT.	6 hrs.
Operation No. 23	MATERIAL 1 clutch shaft.	ADJUST CLUTCH.	6 hrs.
Operation No. 028	MATERIAL None.	ADJUST CLUTCH.	¾ hr.
Operation No. 028T	MATERIAL None.	ADJUST CLUTCH THROW.	1 hr.
FORDSON TRACTOR		OVERHAUL TRANSMISSION AND CLUTCH	
Operation No. P32	Operation No. P32	OVERHAUL TRANSMISSION AND CLUTCH	6 hrs.

(Continued from page 19)
for the shop employing less than six men, any of the Standard repair order forms can be utilized. A sample of a simple and efficient form is the one used by Maxwell, shown at fig. 3 and 3A.

In connection with forms for Flat Rate, MOTOR AGE can supply readers with the name of a printing firm that specializes in shop forms of all descriptions. Repair Order forms are usually printed in triplicate and are filled out with pencil or on the typewriter. When printed in triplicate these forms are generally of three different distinct colors. In this article we shall consider the three copies as being the WHITE, YELLOW and BLUE.

The Third Form Is the Daily Operation Ticket

This form, illustrated at fig. 4, is valuable as a record to determine whether your time limits on the Operation Schedules are correct. Its main function, however, is to act as the "Mechanic's Time Clock Card." There are spaces provided at the bottom of the card for ringing the clock "in" and "out" at the beginning and end of day and at noon. It is at the same time an Operation Clock Card and the mechanic should ring this card in the column headed "Time Started" at the beginning of each repair operation. When the operation has been completed the card is rung out in the column marked "Time finished." The card as illustrated is designed for one certain make of clock and in case it should not fit your particular clock the general arrangement can be transferred to a card of the proper size to fit your needs.

Illustrating How the Forms Work

The path or circuit of the forms when put into actual service is as follows: A customer drives into your establishment

Tel. Name <u>72</u>	Customer's Order No. <u>_____</u>	BLANK MOTOR COMPANY MAXWELL MOTOR VEHICLES <small>22 MAIN STREET DOVERILLE, MICH.</small>	INVOICE Nº 144763
Phone No. <u>MI 6431 3736</u>			
Owner <u>James A. Brown</u>		License <u>384-725</u> Mileage <u>7541</u>	
Address <u>584 Ohio Street</u>		Chassis <input type="checkbox"/> Car No. <u>Maxwell 5 STAT 778</u> Body Type <u>Boeing</u>	
Foreman	O. K.	Inspector	O. K. Motor No. <u>405251</u>
Quotations Received 	INSTRUCTIONS		PRICE COST
1908 800	Grind Valves including removal and installation of cylinder head, remove carbon, adjust tappets and tune motor. Remove and install radiator assembly, new hose if necessary.		25 95
Total By Flat Rate <u>7.25</u> By Time <u>7.00</u> Double Work <u>7.00</u> Material <u>1.05</u> Total <u>71.25</u>			
The Workmanship covered by this invoice is guaranteed. We shall make good all defective work that is reported within 48 hours.			
Car Wanted by <u>10:00 P</u> M <u>10/30/22</u>		Delivered by <u>C. A. Jones</u>	
Date Delivered <u>10:40 A</u> M <u>10/29/22</u>		Signed by <u>James A. Brown</u>	
<small>Print Name _____ Signature _____ Date _____</small>			

for a valve grinding job. The procedure after greeting him is to

1—Write the Name, Date, Address, Telephone Number, License Number, and Car number in the spaces provided on the **INSPECTION REPORT**.

2—REGARDLESS OF WHETHER OR NOT the customer wants you to give the car an inspection or road test, LIST ON THE INSPECTION REPORT any apparent repairs that should be made. THEN if he does not care to have you do the extra work recorded on your re-

port ask him to approve the operations that he desires, which in this case we have assumed is the Valve job only.

3—The next step is to find the OPERATION number and LABOR CHARGE in your Flat Rate Schedules and then write these on the INSPECTION REPORT.

4—The customer puts his signature on a copy of the INSPECTION REPORT and you give him the duplicate. EXPLAIN TO HIM THAT THE AMOUNT OF THE CHARGE SHOWN IS FOR LABOR ONLY AND THAT ALL PARTS WILL BE CHARGED AS USED.

CHARGED AS USED.

5—The customer may leave now and the next step is to WRITE THE RE-PAIR ORDER. With a good hard pencil COPY from the Inspection Report Form the OPERATION number and LABOR CHARGE and word the description of the job exactly as it is written in your FLAT RATE SCHEDULES. When the writing is finished you will retain the WHITE and THE YELLOW copies but send the BLUE copy to the shop attached to the radiator of the car.

When the Car Reaches the Shop

6—This is where the daily OPERATION TICKET comes into play. The mechanic assigned to the work rings the ticket in the column marked "Time started" and writes the OPERATION number opposite it on the same card.

7—The mechanic finds that he needs two new valves. He writes that notation on the back of the REPAIR ORDER. The Foreman makes the same notation on the other two copies and then takes the necessary steps to secure the needed valves.

When the Job Is Completed

8—When all the work on the valve has been completed, the mechanic rings out his DAILY OPERATION TICKET.

(Continued on page 24)

Let the Map Tell You Where Service Sales Are Weak

Colored Tacks to Represent Cars of Each Year's Make Will Indicate Where to Seek Winter Business

By CLYDE JENNINGS

TERRITORY maps and colored tacks are much used to show recent business, where each salesman has prospered and in what districts the new cars have gone. Such use of maps and tacks has proven profitable for the new car sales department and should be just as valuable to the service sales department.

First off, the dealer who uses this system must resolve to sell service. That is quite necessary, for a service sales plan is no good without an intent to sell service.

Such a resolution presumes that the dealer has service to sell; that he has a fairly efficient shop that is equipped with the tools necessary to service the car that he sells. If he has not, the quicker he gets out of business the better, for it will cost less to get out of the selling business now than to hang on and be forced out.

So we will assume that the dealer we are talking about:

Wants to sell service

That he has potential service to sell

That he wants repeat orders for new cars.

This understood, we will take the map of the county in which this dealer is in business, eight colors of tacks and proceed.

First off the red tacks, they are selected to represent the cars more than seven years old, as we presume that these cars need attention more than the others, also their good running qualities are the best recommendation for the line of cars the dealer is selling. Also, the owners of these more than seven year old cars should, by this time, be ready for new ones.

Next we want a list of all of the cars registered in the county. These can be obtained from the local or state automobile dealers' association or from the secretary of state or the county clerk or any other source of information that exists in your commonwealth.

We are presuming, of course that a dealer is a member of the local and state associations and that he likes to make the manager of the association work for him once in a while. So if the dealer does not know how to get this list, ask the secretary.

Most states now list licensed vehicles by years. If not, the dealer must get that information himself. So the dealer can pick out the cars older than '17 of his make and post them on the map as red tacks.

Recent investigations have shown that

the average life of all makes of automotive vehicles is 6.7 years. That should indicate that your more-than-seven year old cars are above the average and are good advertisements.

Then take the '17 cars. Put each one of these on the map with a green tack. And so on down to this year, with a different color for each year's model.

The story this map will tell you will depend entirely upon the imagination that you can put behind the contemplation of it. Suppose you have been in active charge of the establishment for ten years. You will remember, as you post John Doe's 1915 car, just how you sold it to the old rascal and that will immediately suggest the appeal that can be made to John Doe now to sell him a 1924 sedan.

The advertising power that is wrapped up in these old cars is beyond measure. It is romance and romance catches more people than anything else. There are bound to be stories of thrills, and thrills catch the rest of humanity. These stories will give you the interest of the entire community and get you the ear of the man who will buy only on an investment basis, for you can go to him and tell him that 50 per cent of the cars that you sold in 1917 are still in the hands of the original owners and are supplying them with necessary and comfortable transportation today.

The above paragraphs are rather beside the point, by-products you might call them. The real use of this map display is to call in the manager of the service department and match his books against your list.

Have him make out a list of the owners you have dug up who are customers of your accessory and shop departments. He will see the point much better if he makes out the list than if you make it out and spring it on him.

Then go over the details and have the service manager find out just why each one of those owners of cars prior to 1917 are not your customers. Find out:

If any one of them has been gypped by you;

If so, how, and what is necessary to make him a friend;

If he did not buy the car of you, where did he get it?

Why did the original buyer of that car not come back to you?

Is that former customer so far gone that he cannot be brought back?

Why did this new buyer not think of you instantly when he needed service on the Runwell car.

If you have so many cars out that it is impossible for the service manager and his force to gather them back into the fold, give a year's sales to each of the salesmen or make some other division of them and get the new car salesmen to soliciting these old owners, each of whom should be a booster, and to adjusting the differences that exist.

If you have a lot of cars out, use the newspapers, cards, letters and other means of reaching your forgotten friends. The big point is to reach them.

After you have reached them, the biggest point of all is to **SELL THEM HONEST SERVICE AT A PROFIT. IF YOU ARE GOING TO GIVE THEM ANYTHING, GIVE IT TO THEM AS ADJUSTMENT AND NOT UNDER THE GUISE OF CHEAP SERVICE.**

(Continued from page 23)

The job is then turned over to the boss or Foreman who gives the car an inspection and if it is O. K. the Foreman or boss puts his signature on the REPAIR ORDER and then figures the TOTAL CHARGE. All three copies of the Repair Order are totalled and kept ready for the customer.

When the Customer Arrives to Pay His Bill

9—When the customer comes to get the car, have him sign the YELLOW copy of the Repair Order in the space marked "Received by." After payment is received give the customer the WHITE copy receipted. You then write the name of the person who received the car and the date of delivery on the bottom line of the YELLOW copy.

The final bookkeeping job is to check the YELLOW copy against the DAILY OPERATION TICKET and enter the transaction in the DAILY SALES BOOK. After this is done you should file all the forms concerning the job numerically, in an envelope arranged according to REPAIR order NUMBER.

CORRECTIONS FOR AUGUST 2 ISSUE OF FLAT RATE SCHEDULES

The first list of operations is minus the title word "DODGE" at the top.

Tabulated under MATERIAL is the entry "6 connecting rod bushings @ 0.60 each" thus should have been "4 connecting rod, etc."

In the Reo operation schedules the time given for Operation No. 6 was 1.8 hrs., this should be changed to 10 hrs.

The time on operation No. 8 and No. 9 are correct so that the entry "1.8 hrs." should be removed from the Reo schedule.

Plumbing as Applied to the Motor Vehicle

More Uniformity and Fewer Types on the Same Chassis Are Requirements for Efficient Maintenance. The S. A. E. Recommended Practices and a Few Notes on Flared Tubing

By PAUL DUMAS

THE modern motor vehicle is so well constructed that it is an uncommon occurrence to hear of one being delayed on the road on account of a broken fuel or oil line. Occasionally, however, there arises the necessity of repairing a leaky connection on either the oil or fuel system and inevitably the maintenance institution, large or small, will run into some operation that requires the removal of, or an addition to, certain parts of its plumbing system, the oil and fuel piping.

The installation of a new carburetor, for instance, will often necessitate the making up of a new gas line and the disassembly of a chassis for a complete overhaul is another instance of where the fuel and oil pipes will be disconnected and probably a new joint formed.

Where a car has been equipped with accessories that require tubing fittings to install, or parts of the plumbing system have been replaced, it is not uncommon to find three or four different types of tubing fittings on the same car.

The presence of three or four types of fittings on one car is not harmful as far as the efficiency of the plumbing system is concerned, but it is economically wrong in that it means the unnecessary expenditure of time on service operations involving those parts. With Flat Rate Maintenance gaining favor daily such a lack of uniformity becomes a

greater item of concern than would seem at first thought.

There is no good reason why more than one type of tubing fitting should be used on the same car, even if this practice is indulged in by a very few car manufacturers.

It is to the advantage of every man

connected with the maintenance of motor vehicles to keep pace with the current practices adopted by the various engineering societies and producers of automobiles and with this in mind the following paragraphs are intended as a brief summary of the present status of tubing fittings with a few notes on the flaring of copper and brass tubing.

Four General Types

There are in general use on oil and fuel lines four separate types of fittings as follows: The packed type, the compression type, the soldered type, the flared type.

Practically everyone is familiar with the packed joint fitting which is used on the gas line from tank to carburetor on the Ford car. With the exception of the Ford installation the packed type fitting is seldom encountered. As long as packing, which usually is of the lampwick kind, with or without graphite, is present in the nut of this type fitting, it can be depended on for ordinary service. It often happens, however, that the nut of this fitting becomes misplaced or damaged through carelessness and not having another packed joint nut handy the workman will substitute a nut from a compression type fitting.

It is the substitution of the compression type nut that causes most of the leakage encountered with the packed joint type of fitting, because the bore at the small end of the compression type nut is considerably larger and allows the packing to squeeze out past the nut and pipe, instead of compressing the pipe as it should.

The nut for a packed joint fitting can be distinguished from the nut from a

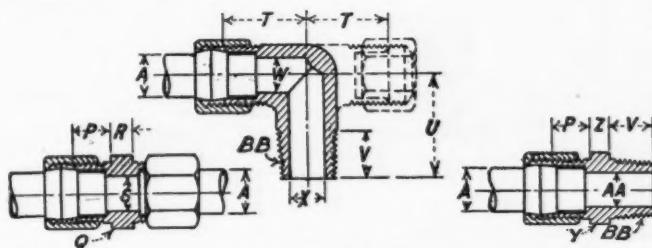


Fig. 1
Solderless compression fittings have been recently approved as "Recommended Practice" by the S. A. E. With this type fitting the pipe should enter the inside of the female fitting at least 3/16 inch

Tubing Diam- eter	Q					Y							
	Hexagon Diam- eter		R	S	T	U	V	W	X	Y	Z	AA	BB1
1/8	1/4	3/8	1/8	5/32	5/32	11/32	3/8	3/32	15/32	15/32	15/32	15/32	1/8
5/32	5/32	1/8	5/32	1/8	11/32	3/8	3/8	15/32	15/32	15/32	15/32	15/32	5/32
1/4	5/32	1/2	5/32	1/8	3/4	3/4	3/8	15/32	15/32	15/32	15/32	15/32	1/8
7/32	7/32	1/8	7/32	1/8	13/32	7/8	7/32	15/32	15/32	15/32	15/32	15/32	7/32
9/32	5/8	1/8	1/4	1-5/16	3/4	3/4	3/8	15/32	15/32	15/32	15/32	15/32	9/32
11/32	11/16	1/8	1-1/2	13/16	0.447	0.447	15/32	15/32	15/32	15/32	15/32	15/32	11/32
5/16	5/16	1/4	1-1/2	13/16	0.447	0.447	15/32	15/32	15/32	15/32	15/32	15/32	5/16
13/32	3/4	1/8	1-5/8	7/8	0.510	0.510	7/8	15/32	15/32	15/32	15/32	15/32	13/32
3/8	3/8	1/8	1-7/8	1-1/16	0.635	0.635	1-1/16	15/32	15/32	15/32	15/32	15/32	3/8
5/8	5/8	1/8	1-7/8	1-3/16	0.760	0.760	1-3/16	15/32	15/32	15/32	15/32	15/32	5/8

BB1 are pipe thread sizes.

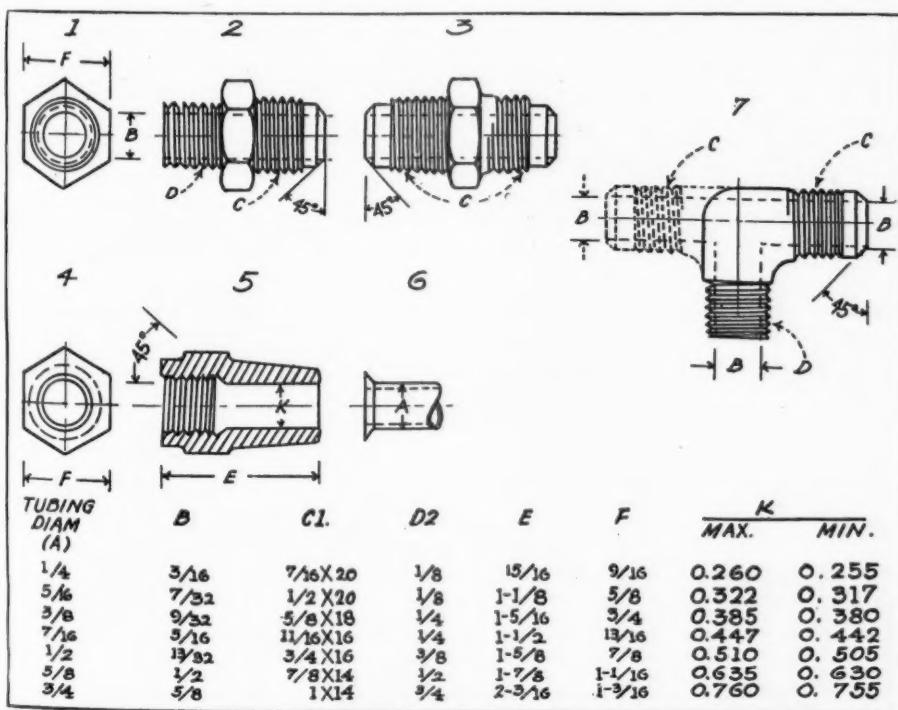


Fig. 2
The values of "K" are of particular importance in securing a good flared joint that may be loosened without danger of twisting the tubing. A thin layer of graphite grease is often applied to the tubing at the "K" portion of the fitting

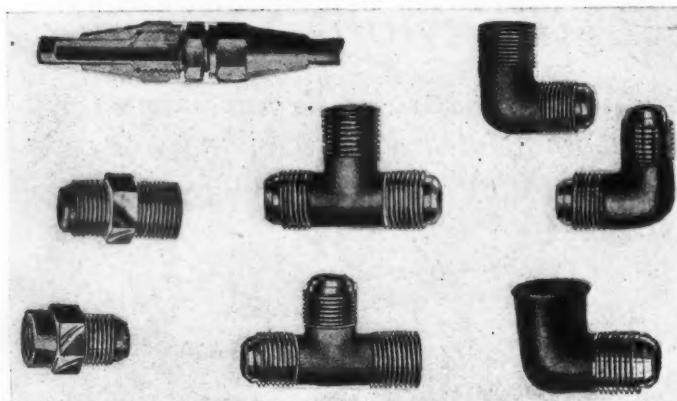


Fig. 3
Nomenclature of tubing fittings. Top right, a tubing union or double union. Top left, male elbow. Center left, male connector. Center, male tubing, tubing tee. Right, tubing elbow. Lower left, female connector. Center, tubing, male, tubing tee. Right, female elbow

compression fitting by the fact that its bore at the small end is not beveled on the inside for a cone or ferrule. The nut for the packed joint is also slightly heavier and longer than the compression fitting nut.

On a carburetor or device that incorporates a packed joint fitting, the end of the tubing should enter the fitting on the carburetor or device at least 3/16 of an inch.

Compression Fittings

The solderless or compression type fittings, which include the various patented fittings using the compression principle, are used very extensively, especially on the large production vehicles. The output of the General Motors Co., with the exception of the Cadillac, are equipped with patented compression couplings of either Dole or Dohner make, and at some points make use of the plain, single compression fitting.

The solderless or compression fittings have the advantage of speed in assembly and will work satisfactorily under average pressures and average conditions of vibration. Perhaps the greatest objection to the compression type fitting is the tendency to cut or score either the pipe or cone, after the nut has been tightened and loosened several times. Much of this scoring can be avoided if the proper amount of tension is applied to the nut and if all dirt is removed from the double cone or ferrule as it is sometimes called, and its seat in the nut.

It is not necessary to solder the cone or ferrule to the pipe, as is sometimes done by some workmen who think this improves the quality of the joint. It is true that the workmanship on some fittings is very poor, but where a ferrule is too loose for the tubing it is better to expand the tubing a little to make it fit tight, or discard it for a better fitting ferrule. It is desirable to have about 3/16 of an inch of the tube extend into the mating fitting wherever possible on this type joint. Within the last 60 days the Society of Automotive Engineers has listed the plain compression fitting as a "Recommended Practice." The recommended specifications for the various sizes are listed under fig. 1.

Flared Fittings

The Society of Automotive Engineers' hand book, in its list of practices, also advocates the use of the flared type of fitting for motor vehicles and the soldered type for motorcycles. Both of these types of fitting are used on aircraft to the practical exclusion of all other types.

Recent experiments to determine the best form of tubing fittings for an installation of hydraulic four wheel brakes, where pressures up to 4000 lbs. to the sq. inch were used, showed the flared method superior to all others. These experiments also divulged the fact that unless a first class job of flaring was applied to the tube that it greatly lessened the ability of the joint to withstand pressure and vibration.

As in other types of fittings the quality of the material used and the workmanship affect the ability of the connection to withstand service conditions and because cheaply made fittings have been and are being sold, the S. A. E. has issued certain specifications which concern these fittings. The dimensional tolerances included in these specifications should be of value to the maintenance institution as they enable a check to be made on fittings purchased. These tolerances are tabulated in fig. 2 with their corresponding location on the fitting shown.

"A"—represents the tubing diameter which is always measured from the outside and not the inside as is done when measuring iron pipe.

"B"—Is the diameter of the opening at the small end of the fitting.

"C"—Is the thread dimensions at the tubing end of the fitting as illustrated at 2 and 3 fig. 1. No. 2 has a pipe thread on one end and a machine thread on the tubing end. It is well to bear in mind that the tubing end of a fitting is always equipped with a straight machine thread and the end that screws into the carburetor or radiator, is generally equipped with a tapered pipe thread. The fitting at 3 fig. 1, is called a tubing union or double union and is intended for installation where it is desirable to disconnect a line of tubing without disturbing either end of the line. It will be noticed that both ends of the fittings are equipped with a machine thread.

"D"—Is the pipe thread size of the plain or non-beveled end of the fitting.

"E"—Is the overall length of the nut.

"F"—Is the width of the nut formed for a wrench and represents the milled opening required on a wrench to fit the nut.

"K"—Represents the tolerances allowed between the tubing and the bore of the nut. It will be seen from the table that a minimum of .005 inch is required for all sizes of tubing up to $\frac{1}{4}$ inch.

Soldered Fittings

For the fuel and lubrication lines on motorcycles the S. A. E. recommended practice calls for a soldered fitting. The use of this type of fitting is not confined

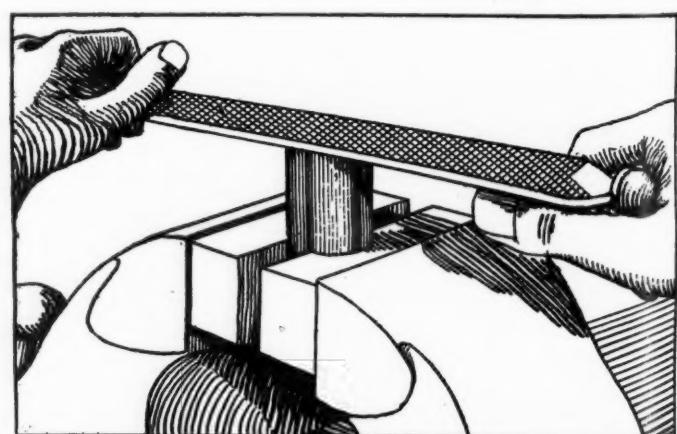
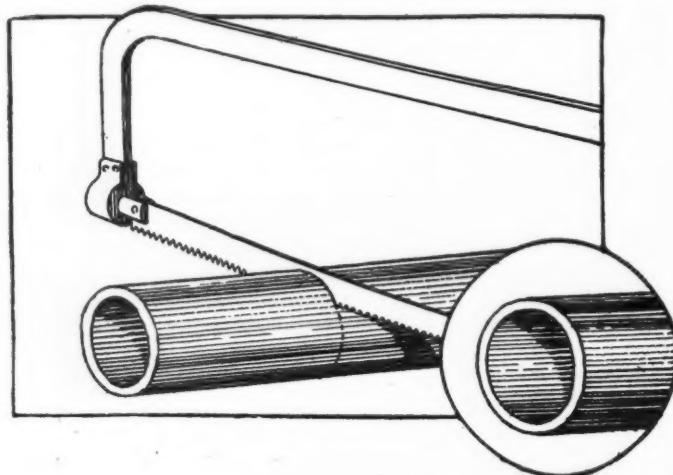


Fig. 4
Sawing and squaring the end of tube is the first step in the flaring operation

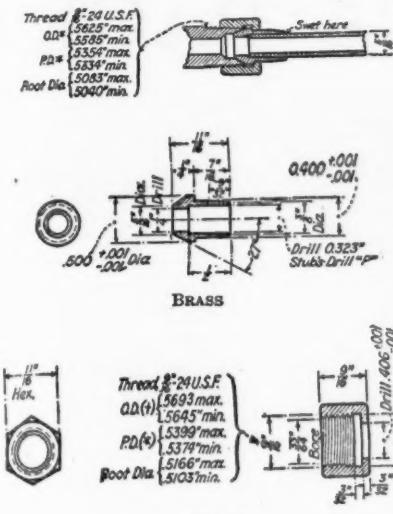


Fig. 5

to motorcycles and they are used quite extensively on old model cars of American manufacture, on airplanes, motor-boats, and the majority of foreign built motor cars. If properly made, and if a good job of soldering is done, this form of fitting will answer as well as the flared union. Unless the fitting be exposed to strong acids, very extreme heat etc.

The regular half and half solder should be used to sweat the cone to the tubing. Unless absolutely necessary the harder solders like silver solder should be avoided as they require such high temperatures to make them flow that unless the workman is careful he will injure the fitting and tubing. The same is true of brazing.

Care should be exercised when sweating the cone to the pipe to see that none of the solder gets on the face of the cone. A soldered connection that is leaking can usually be cured by grinding or reseating the faces of the two elements the same as grinding an engine valve. Fuller's earth, crocus, or pumice are suitable for the reseating process. The recommended specifications for a 5/16 inch soldered tubing fitting are shown in fig. 5.

A Good Flaring Job Is Easily Accomplished

There is only one correct method of flaring tubing and that is with a tool

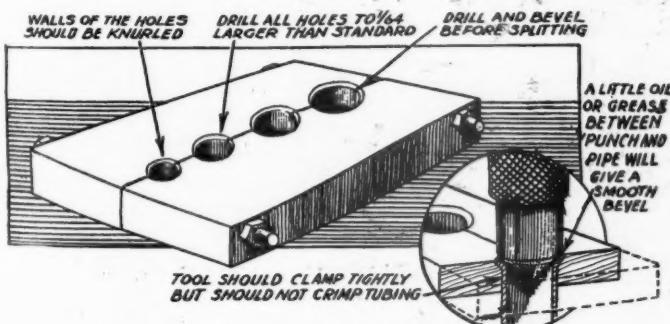


Fig. 7

An efficient flaring tool that can be made without elaborate equipment. It will be found that threading the bore of the holes can be accomplished much easier than knurling as suggested above. The idea in either case is to make the tool grip the tubing

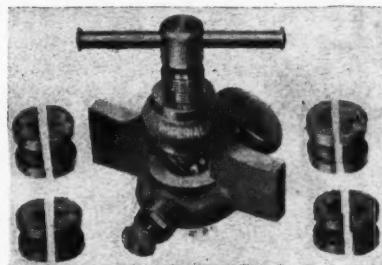


Fig. 6

Fig. 5.—The soldered type of tubing fittings are the recommended standard for motorcycles. The specifications are for a 5/16 tubing fitting. Half and half solder is advisable for sweating

Fig. 6 and 6-A.—A ready-made flaring tool selling for less than \$5. The threaded screw "C" has a beveled face "D" which flares the tube held between the split die "B." No hammer is necessary with this tool

built for the purpose, shortcut methods to the contrary. There is illustrated at fig. No. 7 a homemade tool that is well suited for the work. The one shown is clamped at both ends by means of suitable bolts, another type which some workmen prefer is similar in all respects except that it is hinged at one end.

In constructing a flaring tool of this kind the holes are drilled into a solid plate of steel to a diameter 1/16 in. larger than the standard tubing diameters. The plate is then split longitudinally by milling or with a hacksaw and the resulting faces are then smoothed by filing or grinding. The splitting process will reduce the diameter of the holes when the two pieces are placed together a little more than 1/32 in., which accounts for drilling the holes oversize at the start.

The effectiveness of the tool will be increased if the walls of the holes are knurled before splitting. Knurling gives a better grip on the tubing which must be retained in position firmly after the flaring operation has been started.

If the mechanic does not have the time or inclination to make his own flaring tool he can purchase one from his jobber. A tool for this work is shown at Figs. 6 and 5A. An advantage of this tool is that no hammer is required for the flaring and instead of being peened the tubing is pressed to shape. It also permits flaring of tubes that are installed in comparatively inaccessible places.

The length of tube to be used is first cut to length, either by sawing or by filing a groove clear around and then breaking the tube at the point of filing. The next step is to square the end of the tubing, which doubtless will have been cut at a slight angle. When the

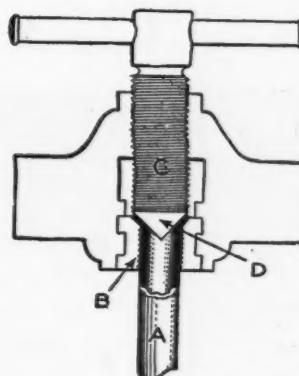


Fig. 6-A

tube has been squared so that the end is at right angles to its length, it is ready for flaring.

If we assume that the homemade tool is being used the next step in the flaring operation is to clamp the tube into the tool. Be sure that the tube is firmly clamped and then clamp the whole assembly in the vise. Using a prick or center punch that has a 45 degree angle, and with a light hammer, begin peening or expanding the portion of the tube extending from the tool. Light blows should be struck and if a real smooth job is desired the bevel face on the punch should be given a thin coating of grease or oil after every eight or ten blows of the hammer.

Avoid sharp bends in tubing especially where the tubing diameter is less than 1/2 inch. Sharp bends in gas and fuel line tubes give rise to "air locks" which not only produce pounding in the pipe but will also cause erratic action of the oil pump or fuel system.

An Easy Way to Bend Tubing

The best and easiest way to bend copper tubing is to insert a coil spring which has the same outside diameter as inside diameter of the tube. The spring is wound into the tubing by means of a brace and is turned in the direction of the coils, which tends to compress the spring and reduce its diameter sufficiently to allow its entrance. This method is superior to using sand or rosin because it eliminates the possibility of portions of the sand or rosin being left in the tubing after the bend is completed.

Don't Forget

If the tubing is thick walled or unusually hard anneal it before flaring or bending. (Copper is annealed by heating to a red heat and then plunging in water.)

Allow as much of the tubing to extend from the flaring tool as the width of the beveled face of the fitting.

Don't Square the Tubing After Flaring, Do It Before It Has Been Clamped in the Tool.

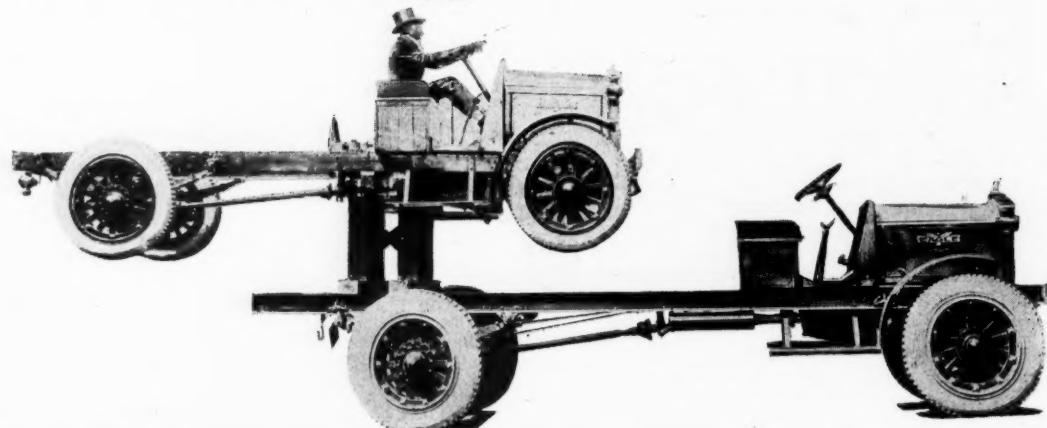
Expand the Tubing Only Enough to Conform to the Bevel of the Hole in the Flaring Tool. Too Much Flaring or Too Much Peening Will Thin Out the Metal and Produce A Weakened Joint.

MOTOR AGE'S PICTURE PAGES



The latest thing from England is a motor dispensary for animals. This truck has been furnished with a special body, fully equipped and manned by the People's Dispensary for Sick Animals, in the east end of London. It makes daily trips to care for animals which are sick or have been injured

A feature which attracted much attention at the St. Louis County Fair, at Upper Creve Coeur, Mo., was this Eagle truck display. One truck was mounted on the chassis of the other in such a way that it could be operated in a circle under its own power, and spectators were allowed to ride as a demonstration



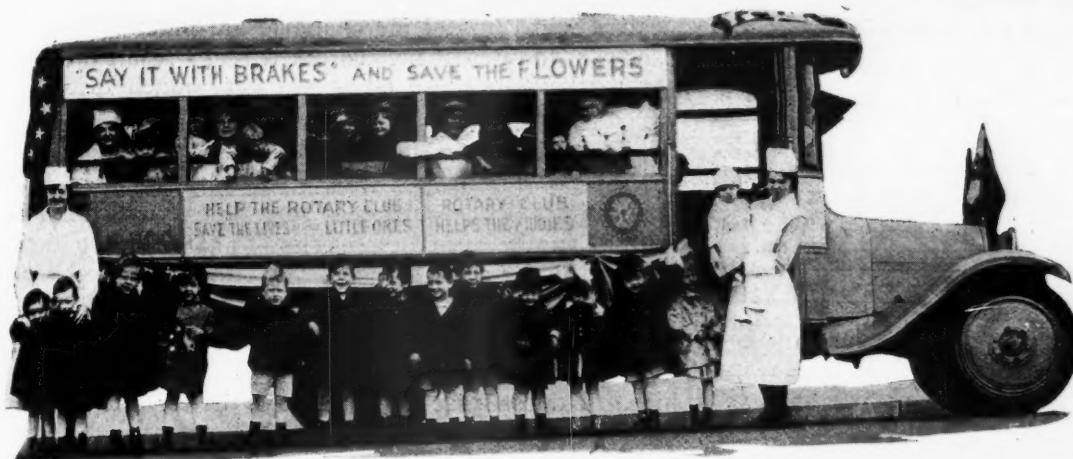
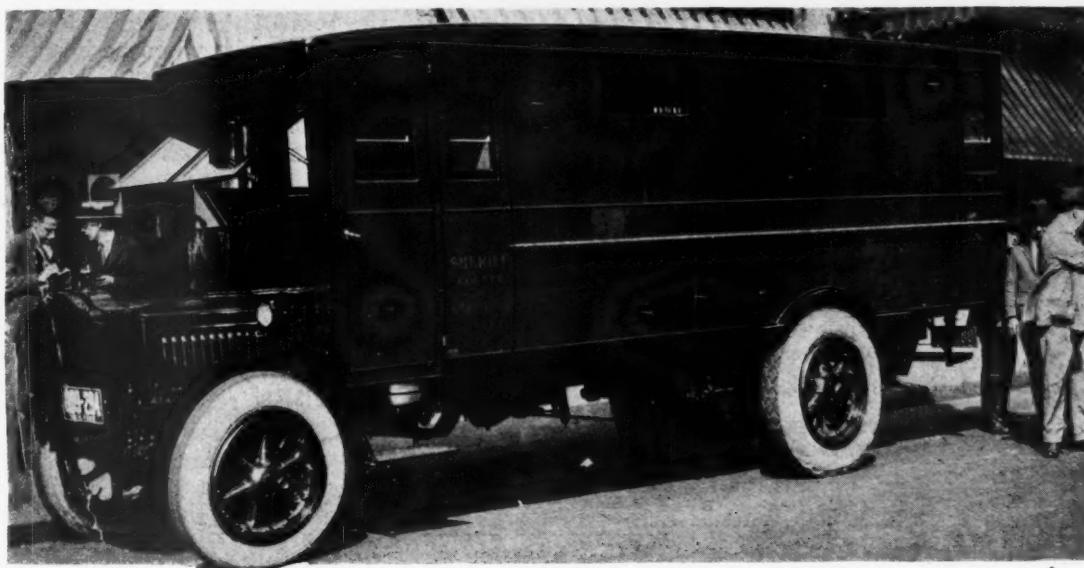
One way to keep your eye on your car is to take it into the restaurant when you stop for a meal. This miniature car, owned by Jack Lanon, of Los Angeles, has a four cylinder Continental engine and, it is said, will make 40 miles on a gallon of gas

OF AUTOMOTIVE INTEREST

❖ ❖ ❖

New York state convicts will hereafter have a car of their own. This armored bus will be used to transport convicts from the Tombs to Sing Sing. Two guards will ride on the rear equipped with machine guns and another guard will ride inside with the prisoners

❖ ❖ ❖



This Graham Brothers bus was purchased by the Washington Rotary Club and is principally used for charitable purposes. The makers say that, so far as they know, it is the only one in service of this kind at the present time but that similar organizations throughout the country are showing an interest in the idea

❖ ❖ ❖

Here is an unusual picture of an automobile accident which, almost but not quite occurred. The driver made that common mistake of trying to beat the train to the crossing but saw his mistake just in time to swing his car up the steep bank at the left. He nearly overturned but was able to avoid a crash and a serious accident

❖ ❖ ❖



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A Flat Rate Goal

ONE of the firms that has pioneered in the flat rate method of doing and selling maintenance work has recently taken some steps that appear to be entirely radical and which many dealers will declare is not justified.

This dealer, early in the year, advertised that the light cars sold by this company would be maintained for 10 cents a day. Lately this guarantee has been reduced to 7 cents a day. This is an absolute guarantee of the amount of the service bills while a car, bought new, remains in the hands of the original owner. Accidents are, of course, barred.

The man who has made this guarantee laughs at the charge that he is speculating or that he is gambling or that he is going to spend any of his new car profits on the cars in the owners' hands.

His position is that he is merely guaranteeing maintenance work at profitable prices for his shop. His reasoning is based on very careful maintenance records kept over a period of 10 years. He has carried the flat rate from the operation to the entire life of a car. He is giving a flat rate its maximum of meaning. He has devised the best and most economical methods of maintenance operations and has built up an organization that can deliver on his plan. Every man in his

shop understands the law of averages and understands that he is working for a progressive organization.

This incident is mentioned merely to give you some time to think over these possibilities before we tell you the rest of the story. The man who has devised this system laughs when he hears that such possibilities are only for the big shop. He says that a small shop can do what the big shop does. In fact he is running small shops on the same basis.

Perhaps we have interested you in this story.



Preventive service can be sold all year, both to transients and regular customers.



A Used Car Problem?

SALES reports reaching MOTOR AGE indicate that in several cities some dealers have carried rather heavy stocks of old model cars past the dates of the stocking of new models. One result of this has been that the dealers having the old cars in stock are seeking to sell them, at a sacrifice of course.

The method of making this sacrifice is the questionable part in the transaction. In several cities these dealers with the old merchandise are bidding high on used cars to interest the customer. As a result the used car markets in these cities are very much disturbed and are entirely out of line with the used car resale values.

It seems rather strange that it is so difficult to lead the automotive dealer to think in fair terms of merchandising. Price cutting is sometimes justifiable and is done in the very best circles. That is when there is a reason for cutting the price, as there is when a car becomes an old model.

It would seem that it would be much better merchandising to sell these out of style cars at open price reductions than to disturb the used car market with wild bids. Honest practice is always better than under cover practice.



"Where did you get the idea that the dealer is entitled to profit only on new cars?"



Swindles

THE most astute automotive dealer is likely to be the victim of a swindler. Bogus checks, part payment customers who remove their cars from the state and other tricks known to some people are always likely to appear.

The National Automobile Dealers' Association has a method of handling these cases, through a detective agency that has given special terms to the members of the association. The report of a number of cases handled through the Association is especially interesting in noting the low cost of recovering the cars or getting a settlement.

The men who carry forth these efforts to regain possession of merchandise fraudulently obtained, understand well the criminal laws and are often able to explain them clearly to the man who has run away with the car. As a result, many of these fraudulent purchasers are willing to settle without cost to the dealer. Several N. A. D. A. members have more than repaid their membership fees by using this branch of the service.

A Busy Winter Looms

IN Detroit they express it in this way:

THE BIG BATTLE IS ON.

The speakers mean by this, that a realignment in the industry is under way and that some, who are not watching corners and looking for a place in which they can best establish themselves, are likely to be crowded out.

Detroit, of course, talks in terms of factories, but the conditions that affect factories are certain to affect dealers.

Whatever is to be true of factories, will be true in the same proportion of dealers. The following points are self evident:

If a factory goes out of business, so will the dealers so far as that car is concerned.

If a factory changes its line in price to appeal to a different class of buyers, so must the dealers so far as that car is concerned.

Whatever re-alignment there may be in models, or in prices or sales methods in the factory; resulting changes must be made by the dealers.

Any success that comes to a factory through a realignment must come through the dealers. A factory without dealers is helpless.

A dealer has one advantage over the factory. It is easier for him to shift than for the factory. A factory makes a tremendous investment when it makes a change and tools up for a certain car. It is pledged to that car for a certain time at least. A dealer can shift more easily, if he has been a good dealer. It is true that cost of turnover for the dealer may be proportionate in his eyes to that of the owners of the factory, but nevertheless, it is a smaller sum. Another car maker will assist the dealer in getting into a new line to a greater extent than another banker will assist the factory.



There is another feature of this winter's activities that directly affects the dealer. This is illustrated in the following examples:

At least three factories have announced production programs that call for three to five times the production of last year, and two to four times this year's production.

Two, if not more, factories that have manufactured only a single line of cars, selling at a high price, are preparing for the production of a distinctly lower priced line.

One factory that manufactured only a low priced car, recently announced a higher priced model.

One factory that has made its large production car available to an entirely new class of buyers by price reductions, is reported to be ready to put a low priced car on the market.

The first item mentioned here means that either the dealers now representing these lines must increase their sales proportionately, or that more dealers must be obtained. If the dealers have sold as many cars as possible this year, it means a dealer increase in proportion

to the increased production. Trebling a dealer force in a year is a tremendous job.

The next item means that dealers who have been selling the high priced cars in connection with one that will be competitive to the new models, will sooner or later be forced by either the factory or by their own business sense to give up one line or the other.

The third item has already brought about a number of dealer changes. The new car became too competitive with other lines handled.

The last item means that probably many dealers will eventually be forced to give up two lines which were once priced safely below the car they looked upon as their leader.



One other interesting proposition is in the rumors that deal with the future:

That a popular priced line is to add a high priced car to its dealer merchandise.

There again, changes must be made, sooner or later.

And so we say, that we believe that the big battle is on in many of the dealer centers of the country.



Indeed, we believe that the dealer who handles two or more lines of cars and who escapes unscathed during the next year is a lucky man.

It is going to be very difficult indeed, for some dealers to make the choice that will be forced upon them. There are dealers representing one or more of the lines that will change during the coming year who have enjoyed pleasant and profitable relations with the factories and it will be hard for them to withdraw from either of these relations.

Perhaps the factories will not demand that he make the choice, but the fact remains that he must make it sooner or later because experience has shown in many cases that the selling of directly competitive lines is unsatisfactory and often dangerous. The dealers who are succeeding in doing this are just enough to prove the exceptions.

The dealer who is looking into the future is doing a good deal of studying. And the dealer who is not looking into the future is likely to be outmaneuvered by his factory. It is betraying no secret to say that factories making cars affected directly in the new alignment of price competition are listing their distributors and dealers who handle two of the lines affected.

Perhaps the factory is looking for a place to light, if they have to jump. The distributor or dealer has the same privilege, but he must be awake to the situation.

Yes, the big battle is on and the dealer who wants to land on his feet must keep himself informed of events and study his own community to know the standing there of cars that will be affected and why.

There never has been an occasion in the history of the automotive industry when information and straight thinking was worth as much to the automobile dealer as they will be in the coming season.

The man who has done his thinking first will be the one who makes the best answer.

N. A. D. A. Educational Campaign

Increased Profits to Be Topic at District Meetings

Dealers Will Gather at St. Louis, Memphis, Columbus and Boston to Hear Experts

ST. LOUIS, Sept. 29.—In an educational plan to improve business conditions and public relations and increase profits for the trade, the National Automobile Dealers' Association will spend \$50,000 within the next nine months, according to announcement from headquarters. The plans for the campaign have been approved by directors of the association, it is announced by C. A. Vane, general manager.

The success of the Pacific Coast district meetings held this year determined the carrying through of the program. In four meetings during the summer at Los Angeles, San Francisco, Portland and Seattle, nearly 1500 dealers, their sales and service managers and salesmen and service men heard messages from leaders in these various subjects designed to increase their own efficiency.

Four more district meetings will be held by the association this year. These gatherings will be held as follows: At St. Louis for dealers from southeastern Iowa, western Illinois, Missouri and western Kentucky and eastern Kansas; at Memphis for dealers from western Tennessee, Arkansas, northern Mississippi, northern Alabama and northern Louisiana; at Columbus, Ohio, for dealers in Ohio, northern Kentucky and western Pennsylvania, and at Boston for dealers in the New England states. Probably 11,000 dealers do business in the territories served by these cities and it is expected that approximately 4,000 will be in attendance.

Successful Dealers to Speak

Professional lecturers and successful dealers will compose the staff of speakers for the meetings. It is proposed that each program be a unified and balanced presentation, giving both theory and fact and tying up "what can be done" by men who have done it. Among the speakers listed at present and who will be used on one or more of the programs are G. G. G. Peckham, president of N. A. D. A., Buick distributor at Cleveland; C. E. Gambill, vice president of N. A. D. A., Marmon and Hupmobile distributor at Chicago; C. B. Warren, president of the Warren-Nash Co., New York Nash distributor; J. S. Knox, Cleveland sales consultant; Percy E. Chamberlain; C. A. Vane and F. W. A. Vesper, president of the Vesper-Buick Automobile Co., Buick distributor, St. Louis.

The programs will set before the dealers the elements that make for success in the business. They will start from a general survey of existing conditions in

the industry as gathered by the association, probable future trends in the business and possibilities for profit. The individual problems will be discussed from the standpoint of salesmanship, service, used cars, financing, accessories, and the like.

The association is now investigating all used car plans in operation throughout the country with the view of being able to send experts into the various trade centers to work with local dealers in improvements of existing used car plans.

Preparations are already under way for the annual meeting of the N. A. D. A. in Chicago during show week. Last year's program built upon the general theme of the "Cost of Doing Business" in retail dealer establishments will again be taken up this year, but from the standpoint of what factories and distributors are doing to insure dealer stability. This, according to the association, is just another way of determining whether net profits are uniformly possible under present methods of distribution, or whether radical changes will be needed to enable the small dealer to survive.

"The next nine months are going to be months of intense activity on the part of the National Automobile Dealers' Association," said Vane in outlining the program. "Until the N. A. D. A. got on its present basis of membership the association never had sufficient funds to take the part that it should have taken in directing the merchandising practices of the industry. Since the change in our membership requirements, however, the treasury fund has been steadily increasing and now the association is at the point where the necessary educational work will be carried on. The entire United States will be districted and leading figures of the industry sent to various points to help unify the thought of those dealers toward proper merchandising principles."

"5 and 10" Stores Get the Jump on Xmas Business

CHICAGO, Sept. 29.—Automotive merchandisers who believe it is too early to begin preparations for Christmas business might take a lesson from Woolworth's Five and Ten Cent Stores. Woolworth's loop store in Chicago already has an elaborate Christmas window display, showing a full line of decorations and ornaments for Christmas trees and other purposes.

The Chicago theaters also have started to drum up trade for Christmas week by covering a large mailing list with announcements of the attractions which will be at the various theaters at that time.

Dorris Stockholders to Take Up Financing of the Company

St. Louis Concern Likely to Withdraw From Haynes-Winton Merger Which Has Been Delayed

ST. LOUIS, Sept. 29.—There is a strong possibility that the Dorris Motor Car Co. will withdraw from the proposed merger with Haynes and Winton into the Consolidated Motor Corp., although no official action has been taken as yet. The matter undoubtedly will be settled at a Dorris stockholders' meeting to be held here Oct. 5 at which time the stockholders will consider steps for the proper financing of the Dorris company to permit of development which they feel their product should have.

It is said that Dorris officials regard the merger off, so far as they are concerned, although they have taken no steps to withdraw, in order to give the Eastern banking interests an opportunity to put the deal through if they can. It is understood here that the completion of the merger has been held up because conditions in the stock market make it inadvisable to float the securities at this time.

Those close to the Eastern promoters of the merger say that even if Dorris withdraws that the consolidation with Winton and Haynes will be carried through and that the promoters are figuring on at least two other automobile companies coming in to fill any withdrawals.

N. A. C. C. WASHINGTON OFFICE

WASHINGTON, Sept. 27.—Washington offices of the National Automobile Chamber of Commerce, located for some years in the Albee building, will be moved on Oct. 1 to the new Transportation building, Seventeenth and H street, northwest. The change is being made in order to give the Washington office of the Chamber more commodious quarters.

FORD WEEKLY PRODUCTION

DETROIT, Sept. 29.—Ford production for the week ended Sept. 25 went to a new high mark with 41,769 cars and trucks for domestic sale, an increase of 278 over the former record week of Aug. 7. Fordson tractor production for the week was 1,857. The Lincoln division of Ford Motor Co. built 198 cars.

STEWART SHOCK ABSORBER

CHICAGO, Oct. 1.—The Stewart-Warner Speedometer Corp. announces it is about to place on the market a new shock absorber which will be very easy of installation. It has a casing of rust-proof enamel finish and a strap of water-proof anti-friction webbing.

New York Closed Car Show Opens

Last Quarter of 1923 to Witness Decline in Output

Next Three Months Likely to Follow 1922 When Production Fell Off

NEW YORK, Oct. 1.—There is little likelihood that in the last quarter of the year, upon which the industry is now entering, operations at automobile producing plants will be carried on at the pace of the preceding three months. The output in November is expected to be somewhat less than in October with a decline of equal proportions in December.

In the fourth quarter of 1922, output of cars and trucks aggregated 701,817 as against 726,045 in the third and it would not be surprising if the same ratio obtained this year, although the total output for the quarterly periods of this year will be much higher.

Some of the major producers, following their customary course, already have announced their intentions to curtail operations during this period. While sales have dropped from previous high levels, the tapering off has not been unusual or in any way alarming, retail business, in fact, keeping exceptionally active. It is realized, however, that fewer cars will be sold in the fourth quarter than in the third and producers, as a result, will delay stocking dealers for spring trade until next year.

Truck business is improving somewhat, figures for August, which are the last available, showing a slight gain over the July total when there was a very pronounced drop from June.

Reports from the Milwaukee parts producing zone indicate capacity bookings in some plants as far ahead as March 1. Makers are being crowded with shipping directions for immediate delivery, this situation indicating the general activity throughout the industry and the tendency of car and truck manufacturers not to suffer any decided let up in operations.

The first of the closed cars shows to be held in the larger cities opened in New York on Saturday and doubtless will prove to be a great factor in keeping sales in the metropolis up to a healthy average. The buying public was given the first opportunity to see new models of cars or refinements in the old in a way that permitted comparison of details.

From now on shows will be staged at intervals in all the larger cities, throughout the country, with the biggest events in the show calendar coming in January and February. In those months the national exhibits will be held in New York and Chicago.

Shows that have been held in rural communities so far this year have been productive of results in stimulating buying among farmers.

HARTZ WINS FRESNO RACE

FRESNO, Cal., Oct. 1.—Harry Hartz, driving a Durant Special, won the 150-mile Fresno race Saturday, with an average speed of 103.65 miles an hour. Eddy Hearne, driving a Durant Special, was second; Jerry Wunderlich, driving a Durant, was third, and Fred Comer, driving a Durant, was fourth. It was a Durant Special clean-up, and Californians had the opportunity for the first time to see the 122 cu. in. single man machines in operation.

Tommy Milton and Earl Cooper failed to place, although they were first and second up to the 113th lap, each driving a H. C. S. Special. A broken water-jacket stopped Milton at the head of the procession in the 123rd lap and Cooper was out for fuel at the 113th.

Bennie Hill's record for this track, 103.70 miles an hour, made one year ago, still stands.

Jay Walking Ordinance to Be Submitted Nov. 6

DETROIT, Sept. 29.—The proposed jay-walking ordinance to be submitted for a referendum vote in this city Nov. 6 has been forwarded to the police department for approval. The following are its provisions:

Pedestrians are to cross roadways only at street intersections, or other crosswalks which may be designated as such by action of the council.

At intersections where a traffic officer is stationed, pedestrians are to cross only when the officer signals for a movement of traffic in the direction they are going.

Pedestrians must look in both directions before leaving the sidewalk to enter the roadway.

Playing, hitching rides, coasting, roller skating, running and soliciting rides in the roadway are prohibited.

The penalties for violating these provisions are a fine of not more than \$5, two days imprisonment, or both.

ENGINEERS VISIT NASH

KENOSHA, Wis., Sept. 29.—The Midwest section of the Society of Automotive Engineers met here last week and enjoyed a splendid day of golf as guests of Charles W. Nash, president of Nash Motors Co. In the afternoon Nash conducted the visiting engineers on an inspection tour of his factories. There was a banquet in the evening with Nash as the principal speaker.

BALTIMORE SHOW JAN. 19 TO 26

BALTIMORE, Md., Sept. 29.—The annual automobile show held by the Baltimore Automobile Trade Association will take place from Jan. 19 to 26. The show, as usual, will be held in the Fifth Regiment Armory.

Nine Manufacturers Display Variety of New Body Types

Coach Models Shown by Maxwell, Durant and Dort—Balloon Tires on Moon and Cole

NEW YORK, Sept. 29.—With nine manufacturers showing new body models, the Automobile Merchants' Association's closed car show, first of a number of these exhibits to be held in different cities, opened this evening. The show is not only a brilliant exposition of motor cars but also calls public attention to the automobile's place in the life of the city by means of an educational exhibit on transportation and transportation facilities.

The show presents to the public the wealth of new cars and new body models brought out by manufacturers within the past few months, most of which have been described in *MOTOR AGE*. Among the body models which are new for the show are three of the coach type, on Maxwell, Durant and Dort chassis, and several three-door sedan designs. The public is having its first look at balloon tires on the Cole and Moon.

The new models shown include:

Dort with a coupe brougham and a sedan, two of five new body models taking the place of 10 models manufactured throughout the past year. The coupe brougham, superseding the coupe, is offered in cloth or leather upholstery. Prices of the new line have not been announced.

Maxwell has a two-door club sedan listed at \$1045. The doors are three feet wide, facilitating getting in and out of front and rear seats.

Durant has a two-door, five-passenger coach selling at \$1185.

Jordan has a two-door coupe at \$2285. R & V Knight is showing a new two-door, five-passenger coupe listed at \$2000.

Gardner's new model is a three-door brougham selling for \$1345.

Auburn has two new sedans, five and five-seven passenger.

Lexington shows a new five-passenger sedan with two extra folded-in seats. The list price is \$2645.

The motor car's place in the life of the metropolis is shown in an exhibit extending along one whole side of the second floor of the Grand Central Palace, entitled "New York of Tomorrow." By means of photographs, maps and models loaned by the Russell Sage Foundation's department of city planning, the New York dealers are showing the public proposed elevated trafficways, some of them intended to relieve congestion on main arteries of traffic, and others to provide a waterfront boulevard extending around Manhattan Island.

Other exhibits show suggestions received from various sources for improv-

(Continued on page 43)

Milwaukee Dealers Report September Sales Above August

Few Dealers Find Slowing Down; Increase Over 1922 Is From 35 to 225 Per Cent

MILWAUKEE, Oct. 1.—Almost without exception Milwaukee dealers report that the number of sales made in September were in excess of those in August, while in comparison with the ninth month in 1922, increases varying from 35 to 225 per cent are reported. The highest figure is that of the two principal low-priced makes and the lowest is that of the highest-priced American made car.

The situation at the close of September was such that, speaking in a general way, the majority of dealers expected to experience a slowing down in October, while the remainder do not look for any sharp falling-off in demand until after Nov. 1 or 15. The bulk of sales in September continued to be in the industrial centers rather than in the rural districts, although farm buying was heavier than had been expected by even the most enthusiastic.

In the final analysis it can be said that the demand is for the makes of cars which have recently announced new models. On the other hand, it is true that some prospects have backed away temporarily, expressing the opinion that they desired to await the results of the radical changes effected in design. The enthusiasm of owners who have acquired cars with, for instance, four-wheel brakes, is exuberant and helping to get dilatory prospects in line.

In conversations with dealers it is notable that the used car situation is rarely commented upon by them as a serious problem at the moment. This may be, however, an expression of the psychological attitude of the seller in his merchandising enthusiasm. The fact cannot be ignored that nearly every new car sale at present involves a used car, and used car prospects are not proportionately so plentiful as formerly with some kind of a new car within reach of almost any pocketbook. The average car offered to dealers now is in far better condition and more salable than in the past, due to the eagerness with which owners are asking for new models of the same type. Most dealers say used cars are moving "as well as could be expected" and that they are not worrying a great deal over accumulation of stocks.

August Sales in California 20 Per Cent Over Last Year

SAN FRANCISCO, Sept. 29.—Sales of automotive vehicles in California during August were approximately 20 per cent greater than they were in August, 1922, according to figures compiled by Motor Registration News, a statistical journal published in Oakland. The sales for August, 1923, totaled 20,515 cars and trucks, as compared with 15,549 in August, last year, an increase of 4,666. Of

these vehicles, sold in August, 1923, truck sales totaled 2406, with 1403 sold in southern California, and 1003 in northern California. Southern California bought 12,178 cars, a gain of 43 per cent over August, 1922, and northern California bought 8,337, a gain of 13 per cent. Should the purchase ratio of new automobiles keep up in California to the end of the year, as it has in the first eight months, the state will have bought more than 270,000 cars by January 1, 1924, exceeding New York state in volume.

Boston Dealers See Promise of Good Sales for Autumn

BOSTON, Oct. 1.—Motor car dealers in Boston find that the letup in buying that set in the latter part of August has passed, and from now until just before the holidays they expect to do a good business. It seems that after making comparisons with a year ago the bit of a slump this year was not so serious. The more experienced dealers let their salesmen get away over the Labor Day holiday figuring that the minds of the majority of the people were set on the end of the vacation season.

September began well and has continued, and now the fall trade is brisk with the demand for closed cars coming faster than it can be supplied. One day a week ago, for example, a distributor in Boston shipped out of his place 320 cars to dealers.

The price changes have not made any great difference here. Nor have the announcements of new cars. But the four-wheel brake really has caused a letup for some dealers, whose salesmen tell them that buyers are holding off until they can get assurances that the makers will not add four wheel brakes in a week or a month after they buy. The used car market is holding up well. This is particularly true on the part of the dealers handling new cars. On the other hand the companies specializing in used cars solely are having their troubles, and do not seem to be prospering.

FLINT IN CHICAGO

CHICAGO, Sept. 27.—Durant's Flint car made its appearance on Chicago's retail market this week at the sales-rooms of the newly organized Flint Chicago Co., at Twenty-fifth street and Michigan avenue. The Flint Chicago Co. was organized by Herman J. Rosenberg, who for several years has been distributing a number of lines in Chicago's north side automobile district. Frank E. Witt, formerly connected with W. C. Auble Co., Durant and Star distributor, is manager of the new company.

TIRE PLANT SOLD

NEW YORK, Sept. 29.—Confirmation is had from the Kelly-Springfield Tire Co. of the sale of its Wooster, O., plant to the Thomas Rubber Co. of Millersburg, O., for \$100,000. The Thomas company will reopen it Oct. 1 and manufacture tires therein.

Jimmy Murphy Returning to Drive in Kansas City Race

Says Faster Cars Beat Him at Monza
—Regrets A. A. A. Cancellation
of His Points

PARIS, Sept. 17 (By Mail).—"The sporting spirit appears to be dormant," remarked Jimmie Murphy, when, on returning to this city to-day, he was informed that the Contest Board of the A. A. A. had deprived him of his championship points.

Murphy remarked that he came to Europe to take part in the leading international event outside the United States, promoted by and under the control of an international body comprising delegates from France, Italy, Belgium, Spain, England and America. "In doing this," declared Murphy, "I missed only one American race, held on a track which had not been built when I left home. I am returning to America as soon as I can find accommodations on a steamer, and shall be ready to start in the Kansas City race. The two Miller racing cars have already been shipped back home."

On coming to Europe Murphy's only definite plan was to run in the European Grand Prix, at Monza. He had no arrangements for the Spanish race and was never entered for that event. Murphy, who is now in Paris with his mechanician Ohlson and Riley J. Brett, is endeavoring to secure berth on a steamer for home. The American race driver declares that the supercharger Flats beat him on speed and acceleration and also had the advantage of a better brake system. Except for one stop to adjust his brakes and a plug which was firing intermittently, Murphy had no mechanical trouble during the race and has to admit that he was beaten by faster cars. He describes the reception given him by Italian sportsmen as magnificent.

Kansas City Race Date Changed to October 18

KANSAS CITY, Oct. 1.—The 250-mile speedway race here, which is part of the A. A. A. championship series, will be run Thursday, Oct. 18, instead of Oct. 17 as originally scheduled. Drivers whose entries have been received include the following:

Eddie Hearne	Durant Special
Harry Hartz	Durant Special
Tommy Milton	H. C. S. Special
Earl Cooper	H. C. S. Special
Bennett Hill	Duesenberg Special
Dave Lewis	Duesenberg Special
Jerry Wonderlich	Durant Special
Harlan Fengler	Wade Special
Frank Elliott	Elliott Special
Leon Duray	Duray Special

In addition a Duesenberg and a White special have been entered for which drivers have not been named.

NEW NORMA FACTORY

STAMFORD, Conn., Oct. 1.—The Norma Co. of America has started work on a new plant here in which it will manufacture Hoffman precision roller bearings.

Decided Improvement Noted in Chicago Retail Sales

Condition, However Is Not General, Many Lines Stop; Used Cars Moving Well

CHICAGO, Oct. 1.—Decided improvement in automobile sales in Chicago has been noted in the last two weeks as compared with conditions prevailing during August and the early part of September.

This improvement, however, is not general to the extent that all lines have benefited by it. On the contrary, some lines not in the class of greatest popular favor are practically at a standstill or going backward. In general these are lines whose models designed for the 1924 season show little or no change from the 1923 line, although there are exceptions to this condition.

Dealers for one popular line whose new models are somewhat revolutionary are having difficulty getting enough cars. All the cars that can be obtained of another popular make are being sold, but future business on the dealer's books is not as great as it was two months ago. This dealer is losing some business because of inability to make immediate delivery.

On the whole sales of new cars are below the mark of two months ago, but better than a month ago and fully up to what might reasonably be expected for this season. Closed cars naturally have the right of way and the trade association is preparing for an elaborate exhibition of these models at the Coliseum this month. Stimulation of sales is expected from this show and general business conditions appear favorable for the remaining months of the year.

Used cars are at a very low price level and consequently successful dealers find it necessary to hold down trade-in allowances. Some dealers, in order to make sales, are making allowances out of line and causing some disturbance in the trade. Dealers who have been conservative in taking in used cars are finding it fairly easy to move them without loss and in many cases at a profit. Used closed cars are in good demand. Truck sales, especially of the lighter types, are improving.

Transportation Pays More Than Eight Per Cent Tax

WHITE SULPHUR SPRINGS, Va., Oct. 1.—Having gathered statistics at the request of the National Automobile Chamber of Commerce, John E. Walker, former tax adviser of the United States Treasury Department, startled the delegates in attendance at the National Tax Association convention, held here last week, by stating that transportation, automobile, steam and electric, paid more than eight per cent of the total tax burden of the nation in 1921. Of the grand total of \$8,950,000,000 collected, more than \$700,000,000 came from taxes levied

against transportation, in addition to numerous special imposts of one kind of another, Walker declared.

Of this amount about \$1,000,000,000 was devoted to highway construction and maintenance. Of this amount detailed figures show that less than half was derived from current miscellaneous and general state taxation. The remainder was drawn from bond issues which will be retired in many instances from motor fees; from special gasoline and other taxes imposed on the motor vehicle owner and from federal appropriations which were more than offset by the federal excise taxes imposed upon the motor vehicle. The result was that but 5.3 cents of the general taxpayer's dollar in 1921 went into highways.

"54 Miles on a Quart" —Inventors Hit A Snag

WASHINGTON, Sept. 29.—The Bureau of Standards now has proof of the axiom that one is born every minute and two are born to smear him.

Three men drove up to the Bureau in a high powered automobile, equipped with a new device on which the car could get 54 miles on a quart of gasoline. Two of them owned the device. The third was a prospective investor. He wanted proof. They had driven from Jacksonville, Fla., to satisfy him.

Agents of the Bureau made the test. They found a separate gasoline tank secreted behind the instrument board from which the motor was getting its gasoline supply without draining upon the customary gas tank at the rear of the car.

The prospective investor notified the police that he had already turned over \$20,000 to the "inventors" before the test was made. The Bureau has informed the police of the fraud and the police in turn are notifying automobile manufacturers and garage owners.

GOOD SALES IN MILWAUKEE

MILWAUKEE, Wis., Sept. 28.—There has been no sign of any hesitancy in the movement of passenger cars through retail channels in Milwaukee and generally throughout Wisconsin. Trade is far more active than it has ever been as September comes to a close. Sales for the month average much higher than in any September of record, and on a dollar and cents basis volume is in excess even of periods when prices of cars were anywhere from 50 to 100 per cent above the present level.

Ford and Chevrolet dealers are not able to make immediate delivery even of phaetons and roadster types, while deliveries of enclosed cars are still farther advanced. The same is true of Buick. Overland dealers are doing a record-breaking business as well. Activity, in fact, is spread over the entire range of price classifications.

Issues Appeal for Banding of Cylinder Regrinders of U. S.

Midwest Regrinders' Association Seeks to Extend Membership to All States

OMAHA, Neb., Oct. 1.—An appeal to the cylinder regrinders of the United States has been issued by the Midwest Regrinders' Association, through its president, John J. Fuchs, Jr., calling upon them to organize local and state associations, or to join existing associations, for the purpose of promoting the cylinder regrinding business.

The Midwest Regrinders' Association is composed of cylinder regrinders operating in Nebraska, Iowa, Kansas and Colorado. Its next meeting will be held at Sioux City, Ia., Oct. 26 and 27, at Hotel Martin, and a general invitation has been extended to all regrinders to attend this meeting. The invitation states that matters of great importance to the industry will be discussed.

The appeal for organization declares the cylinder regrinders must take steps to combat propaganda to the effect that automobile engines can be properly reconditioned in a short time with inexpensive tools.

The following active regrinding associations are listed in the appeal:

American Cylinders Grinders' Association, W. A. Baker, president, 3848 No. Clark Street, Chicago, Ill.

Association of Cylinder Grinders of Missouri and Illinois, Chas. A. Marien, president, 4216 West Easton Ave., St. Louis, Mo.

Central Cylinder Regrinders' Association, T. A. Myer, president, Indianapolis, Ind.

Metropolitan Cylinder Grinders' Association of New York, Dwight W. Gaven, president, 15 Hedden Place, Newark, N. J.

Midwest Regrinders' Association, John J. Fuchs, Jr., president, 1007 Farnam Street, Omaha, Nebr.

Southern Automotive Grinders' Association, J. B. Cook, president, 278 Washington Ave., Memphis, Tenn.

New Cars in Michigan From March 1 Total 102,572

DETROIT, Sept. 29.—New cars titled in Michigan from March 1 to Sept. 1, totalled 102,572, according to a report to members issued by the Michigan Automotive Trade Association. Of this total Wayne county had 39,828. New trucks titled in the same period were 8,920 of which Wayne county took 3,682. New cars titled in the state in August totalled 11,638, the Wayne total being 5,270, and new trucks in August totalled 1,060 of which Wayne took 466.

In the totals for the six months period in the state light cars predominated with an approximate total of 67,000 cars titled. Sales in the price class \$700 to \$1,000, approximated 7,800. In the medium price field, \$1,000 to \$2,000 sales approximated 25,000. In the higher priced cars the total titled was approximately 1,600.

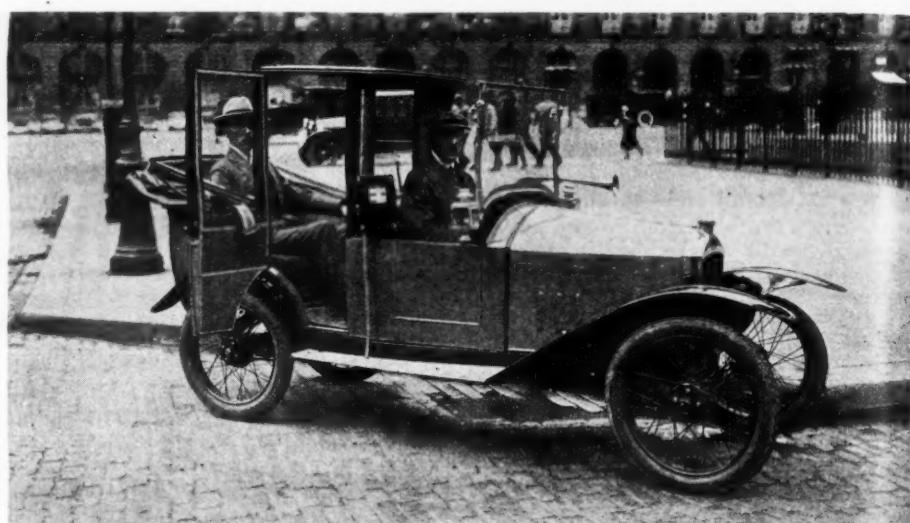
250 One Man Taxicabs Make Debut in Paris Streets

New Cabs to Operate at Half the Cost of Others: Eight Cents Per Mile

PARIS, Sept. 15 (By Mail).—Two hundred and fifty single passenger taxicabs, operating at one-half the rates of any other taxis, will come on the streets of Paris this month. This is an attempt to meet the requirements of business men who generally travel alone and who want the fastest means of locomotion at the lowest possible price.

The one-man taxicab covers the first 600 metres for 60 centimes and additional 200 metres at 10 centimes, this being equivalent to 80 centimes per kilometre, or, at present rate of exchange, 8 cents per mile. André Hamon, the promoter of this scheme, declares that these low fares are possible not only because of reduced running costs, but because of the important saving on overhead charges.

There will be no night or Sunday service and no attempt to do railroad depot or theater work. The cars will come on the streets at 8 in the morning and they will all be off at 8 at night. In conse-



quence there will be only one set of drivers and one garage staff. Mechanical overhauls will be carried out on Sundays.

Drivers will take 50 per cent of their earnings, compared with the 30 per cent usually given.

The chassis made use of is a small Peugeot with a four-cylinder engine of 55 by 80 mm. bore and stroke. Except

for a stiffening of the frame members, at the rear, there will be no mechanical changes. The body is a landaulet type similar to the four-passenger cabs except for dimensions. As there will be very little night driving, even in winter, oil lamps only are fitted. There is no electric starter. If successful, the first fleet will be supplemented by 750 more cabs at an early date.

Public Utilities Commission Cannot Halt Bus Operation

DETROIT, Sept. 29.—Michigan Public Utilities Commission has handed down a decision that it has not the power to refuse to permit motor bus operation paralleling interurban and railroad lines, even though the latter are furnishing all the service needed. Protest had been filed by rail lines against all bus lines, following the passage by the 1923 legislature of a law giving the commission power to regulate buses.

A test case was made on the protest of the Grand Trunk System and the Rapid Railway against the Wolverine Transit Co. operating six buses to Mt. Clemens from Detroit. The decision read: "The commission is of the opinion that Act No. 209 limits the inquiry of this commission in determining whether a public convenience and necessity exists in the motor vehicle business." It was explained that if the commission did have the authority to inquire into the related activities of the various carriers it would have to find that the buses are unnecessary between Detroit and Mt. Clemens.

The railroads are expected to carry the matter to the State Supreme Court.

ACCESSORY MEN STUDY SELLING

ATLANTA, Ga., Oct. 1.—The Accessory Dealers' Division of the Atlanta Automobile Association, which adjourned during the summer months, held its first fall meeting last week, featured by an open forum discussion on methods by which the association can be of greater benefit to its members, which now number about 60 representative accessory

and equipment dealers of Atlanta. It was decided to stage at each meeting hereafter a special discussion on merchandising and kindred problems pertaining to the sale of accessories, with each member to exchange with the others his ideas and plans to build sales that he has found the most productive.

Dealers in attendance, representing more than 90 per cent of all the equipment dealers and jobbers in Atlanta, agreed that summer business this year has been in the largest volume of any previous summer in the history of the automobile industry in Atlanta, and that the present year will undoubtedly prove the largest in accessory and equipment sales in this district of any previous year.

NEW OLDS 6 AT \$750

DETROIT, Oct. 1.—Prices of the new Oldsmobile six-cylinder line, detailed description of which was published in last week's MOTOR AGE, range from \$750 to \$1095. One model, the five-passenger sport, has not yet been priced. The list as announced is as follows:

Touring	\$ 750
Roadster	750
2-Pass. Cab	950
Coupe	1035
Sedan	1095

PACKARD ELECTRIC CO. EXPANDS

WARREN, O., Oct. 1.—The Packard Electric Co. has broken ground for the construction of a factory addition at a cost of approximately \$350,000. The new plant is to be ready for occupancy by Jan. 1 and will be devoted exclusively to the manufacture of transformers, permitting the old plant to be used for increased production of automotive cable.

Chicago's Closed Car Show at Coliseum Oct. 13-20

CHICAGO, Sept. 29.—Chicago's closed car show will be held at the Coliseum Oct. 13 to 20 with 43 members of the Chicago Automobile Trade Association as exhibitors. Sixty makes of cars will be displayed. Only new, bona fide enclosed cars will be shown, California tops and special side curtain enclosures being ineligible.

Spaces were assigned by a drawing of numbers, hence the business standing of the various exhibitors had no influence on the allotment. Members of the show committee are Harry P. Branstetter, chairman; Joseph F. Davis and J. R. Histed. L. L. Fest will be show manager.

Preceding the show, the Master Lady Driver's contest, inaugurated last year, will be held on Oct. 11. This contest includes a 30-mile tour over city boulevards, and backing, braking and parking tests. Cash prizes and silver trophies of a total value of \$400 will be awarded to winners.

NEW ACME TRUCK PRESIDENT

DETROIT, Oct. 1.—Clarence Williams, of Cadillac, Mich., has been named president of the Acme Motor Truck Co. of that city, succeeding W. A. Kysor whose resignation was recently announced. Williams was formerly in the lumber manufacturing business but has not been engaged in active business recently. The company will announce a new sales manager within a short time to succeed C. J. Helm who is now secretary and general manager.

Fire Prevention Week Gives Chance for Profit in Sales

National Underwriters Suggest Display of Hand Extinguishers and Other Safety Devices

NEW YORK, Oct. 1.—An appeal to the automobile industry for co-operation is made by the National Board of Fire Underwriters, whose headquarters are located here. The board points out that automobile accessory dealers will find in Fire Prevention Week—to be held this year from Oct. 7 to 13—a good opportunity to jump their sales volume by pushing items that relate to fire prevention and fire protection in and about the motor car.

Window trim and counter displays featuring approved types of hand chemical extinguishers, self-closing waste containers, safety gasoline cans, buckets for sand, electric flashlights and batteries, non-inflammable polishes, cleaning brushes and chamois will prove a definite tie-up, it is declared. To these items may be added approved carburetors, wire and wire assemblies, electric vaporizers, lighting and ignition switches, and approved car heaters of the type to be attached to the exhaust. All these materials and devices bear more or less closely upon fire-safety in motor cars. Sheets of asbestos to be used in covering floor boards, where they give evidences of being charred from the muffler, might be displayed to advantage.

The board also suggests the use of posters bearing slogans along the lines of the following will be effective in drawing closer the connection between the displays and the significance of the occasion: "Clean Up Rubbish and Avoid Fires; Fires Causing Losses of About \$1,250,000 Annually Are Bred in Rubbish Heaps"; "Keep a Bucket of Sand in Your Garage to Combat Gasoline and Oil Blazes"; "A Fire Extinguisher on Your Car May Save the Members of Your Family From Painful Injury and Your Property From Destruction"; "A Proper Mixture For the Automobile Owners of America—Combine Carefulness with Intelligence in Handling Garage Fire Hazards"; "Gasoline Vapor Is Highly Dangerous—Take No Chances With It"; "Repair Short Circuits in Your Wiring System; They Often Cause Fires;" "Don't Smoke Around Garages or While the Gas Tank Is Being Filled;" "Clean Up Rubbish in Garages and Remove Oily Rags."

August Production Placed at 334,261 by Dept. of Commerce

WASHINGTON, Sept. 29.—Production of passenger cars and motor trucks in August aggregated 334,261, according to figures compiled by the Department of Commerce based on reports from 181 manufacturers, ninety-four of whom make automobiles and 115 trucks. Among the latter are included twenty-eight producing both cars and trucks.

Figures for earlier months, it is an-

nounced, include 10 additional manufacturers now out of business.

Production for all of 1921, 1922 and eight months in 1923 is as follows:

	PASSENGER CARS		
	1921	1922	1923
Jan.	43,086	81,693	223,708
Feb.	68,088	109,171	254,651
March	130,263	152,959	319,637
April	176,439	197,222	344,475
May	177,438	232,433	350,181
June	150,263	263,027	337,144
July	165,615	225,079	297,257
Aug.	167,755	249,460	304,010
Sept.	144,670	187,661	—
Oct.	134,773	217,493	—
Nov.	106,081	215,284	—
Dec.	70,725	207,932	—

MOTOR TRUCKS

	1921	1922	1923
January	4,831	9,517	19,533
February	7,830	13,290	21,961
March	13,328	19,919	34,905
April	18,070	22,486	37,718
May	18,070	23,948	43,228
June	14,328	26,171	40,819
July	11,132	21,956	30,359
August	13,391	24,601	30,251
September	13,975	19,333	—
October	13,144	21,698	—
November	10,480	21,803	—
December	8,589	20,160	—

ZILLMAN STAGES PEORIA SHOW

PEORIA, Ill., Oct. 1.—The big feature of the Greater Peoria Exposition, which opened Sept. 28 and closes Oct. 6, is the display of motor cars. In years gone by, the event here has been known as the National Implement and Vehicle Association show and it has competed with the state fair in array of attractions and in attendance. It was decided this year to change the name but to operate it along the same general lines. The big building which was formerly devoted to agricultural implements, was turned over to the automotive dealers and 40 secured space to display automobiles, trucks, tractors, and accessories. This was the largest number ever recorded at the annual display and the decorations were more elaborate and artistic than in previous years, the result being that larger crowds viewed the exhibits than ever before. The event was under the management of Fred C. Zillman, secretary manager of the state and local dealers associations, and much of the credit for the great success was due to his energetic efforts.

PARTS DISTRIBUTION DISCUSSED

DETROIT, Sept. 29.—Changes in parts distribution methods, designed to improve service and which at the same time will protect the interests of dealers, are being worked out by Motor Truck Industries, Inc., through a special committee which will probably complete its work in time to permit of adoption of set policies at the annual meeting of the association in this city Nov. 21. The committee met with directors of the association this week when a number of proposed plans were discussed.

The parts distribution committee is headed by E. A. Williams, Jr., president of Garford Motor Truck Co., and comprises both truck and unit parts manufacturers. The changes contemplated are entirely of a marketing nature and will have the co-operation of parts makers and truck makers in making them effective.

Saginaw Used Car Plan Is Adopted by Peoria Dealers

Illinois Automotive Trade Association Likely to Recommend It for State Wide Use

PEORIA, Ill., Oct. 1.—The Peoria Automobile and Accessories Dealers Association has voted to adopt the Saginaw system of handling used cars, but with slight modifications. This is the second Illinois city to take this step, the dealers of Springfield having recently voted to take the same action. The Peoria dealers, in common with those of all other cities of the state have long wrestled with the used car problem. After trying out numerous methods and indulging in many experiments, the dealers here have finally reached the conclusion that the Saginaw plan is the most practical and it is expected the Illinois Automotive Trade Association will shortly recommend its adoption by all affiliated local associations.

At the last annual convention at Quincy, a resolution was adopted asking the directors to conduct an investigation of the used car problem and report back concerning the most practical method. It is expected that the report will endorse the Saginaw plan. F. C. Zillman, secretary manager of the state body and also secretary of the Peoria organization, plans to call upon the other local associations from time to time and explain the system and tell how it is working out in Peoria and Springfield.

Instead of the standard used car valuation as compiled in the metropolitan cities, the Peoria dealers have their own compilation, showing the maximum value of every make of car and of every model by years. This maximum must not be exceeded by any dealer in taking in a used car in part payment for a new. Should a car be taken in on a trade that needs considerable overhauling, the estimate of the cost is subtracted from the allowance in the book for such a car in good condition. When this car has been overhauled, it is listed at the amount designated in the book, plus 20 per cent which represents the dealer's profit in the transaction.

FUEL FROM MOLASSES

HILO, T. H., Sept. 28.—Motor fuel, in the form of alcohol manufactured from waste molasses, is to be produced on a large commercial scale at the plant of the Pampanga Sugar Mills Co. at Del Carmen, near Manila, P. I., according to R. Benton Hind, manager of the company's plantation. This decision was reached at a recent meeting of the board of directors of the company in San Francisco. The process invented by J. P. Foster, a sugar manufacturing expert of the island of Maui, one of the Hawaiian group, will be used. On his way back to Manila Mr. Hind conferred with Mr. Foster and explained the plans of the company in the matter of manufacturing motor fuel out of molasses.

Competition Gives Ethics a Severe Jolt in Los Angeles

Business Practices Formerly Observed Are Forgotten as Sales Are Made Without Cash

LOS ANGELES, Oct. 1.—Practices which formerly were regarded as ethics in automotive merchandising here are being relegated to the discard. Cars and trucks are being put in the hands of owners with almost every plan of inducement to buy that can be devised. Undoubtedly this is serving to keep up the number of sales, and at this time there can be no prediction as to the resulting effect on the financial status of the dealers. It is not anticipated this will come about unless there is a sudden slump in demand.

It formerly was the custom of automotive merchandisers here when making a sale to require at least one-third of the purchase price as a down payment. The deferred monthly payments were not permitted to be less than one-tenth, or at the outside, one-twelfth of the balance. Trade-ins were not accepted unless there was a cash payment in addition.

This is changed now. A used car or truck is acceptable as the first payment and no cash in addition is demanded. No secret is made of this way of doing business, as advertisements are inserted in the local papers announcing that used cars will be taken as first payment, and if the owner cannot deliver a clear title to the used car itself, the equity will be accepted. Deferred payments are almost any sum the purchaser may desire, and are spread over a period as long as may be necessary to cover the balance. There are said to be instances on record, of interest having been charged on sales of this kind that violate the state law, and dealers recently were notified by the Attorney General's office that unless this is stopped, prosecution for usury will be entered. Whether this notice will have any effect on the system, remains to be seen, as it is the long period of payments at high interest which have made the business possible, because financing companies are handling practically all paper of this type.

Motor truck sales activities are being conducted along the same lines as passenger cars, or even to the extreme. Trucks are being put in the hands of purchasers without any down payment and no payment required until ninety days have elapsed. A traded-in truck is acceptable as the first payment. Instances have been reported of no cash being required for three months and successive payments being at the same interval. The idea in this is said to be to permit the purchaser to pay for the truck out of its earnings.

This system naturally is leading to flagrant abuse. An ostensible purchase may be made and the buyer operate the truck for six months and then permit it to be replevined. He has made but a single payment and the rest of the earn-

ings have been used as he saw fit. This means that within the near future some dealers are going to acquire a heavy stock of repossessed trucks which will have to be reconditioned and retired before they will be saleable again. Trucks have been very much in demand throughout the summer months, and as their earning capacity is high, ostensible purchasers have through this method of doing business on the part of the dealers, been in position to derive a good income from their trucks and devote it to their own purposes, instead of applying it on the purchase of the truck.

The sales practices referred to have become quite general.

Activities Like These Help Automobile Sales

LANCASTER, O., Oct. 1.—The Fairfield County Automobile Club in order to do away with the dangers of a railroad crossing purchased a field of growing corn and cut it, long before it was matured. Secretary M. H. Fadner was the author of the idea which resulted in the removal of the menace to motorists. At a recent meeting of the club the board of directors adopted standardized road service for its 800 members.

ZANESVILLE, O., Oct. 1.—Through the efforts of the Muskingum County Automobile Club, the roads leading into that city are now patrolled by salaried deputy sheriffs and there are no speed traps in the county. The deputy sheriffs will make an honest effort to enforce the laws in the interests of life and property and will not seek to arrest on technicalities.

NEW FORD PRICES

DETROIT, Oct. 1.—New prices are announced by the Ford Motor Co. effective at once:

	Old Price	New Price
Chassis	\$235	\$230
Touring car	298	295
(With starter)	393	380
Roadster	269	265
(With starter)	364	350
Sedan (four door)	725	685
Coupe	503	525
Truck chassis	380	370

The price of the Fordson tractor is increased to \$420. There is no change in the Lincoln prices and the company reports that none is contemplated. No statement is made by the company in connection with the price changes.

VANE PLANS EASTERN TOUR

ST. LOUIS, Oct. 1.—"Automobile Dealer Profits, How Much Are They, Where Do They Go and Why?" a discussion of dealer income and expenses will be the topic of C. A. Vane, general manager of N. A. D. A., during his coming speaking trip through the east. Vane will visit Philadelphia, Baltimore, Newark, Brooklyn, Providence and Springfield, Mass., on request of N. A. D. A. members in the cities mentioned.

Four Killed in Engine Tests at U. S. Bureau of Standards

Gas Filled Chamber Explodes When Gasoline Saving Device Is Being Tried

WASHINGTON, Sept. 27.—An explosion which occurred in the Bureau of Standards' Laboratory, while tests were being made on gasoline-saving apparatus calculated to save 500,000,000 gallons of gas annually on automobile engines, took a toll of four lives and injured five. Among those killed was Stephen M. Lee, mechanical engineer, and a member of the Society of Automotive Engineers.

The test which caused the explosion was being made by the Bureau at the instance of the National Automobile Chamber of Commerce, the American Petroleum Institute and the Society of Automotive Engineers and was conducted specifically to determine if a greater mileage could not be gotten out of automobile engines, with various carburetor adjustments.

Experiments were made with various makes of engines to determine the volatility of motor fuel and to secure the greatest number of miles per gallon of gasoline.

At the time the explosion occurred an experiment was under way with a small engine of popular make and the motor was being given an accelerator test, being throttled to 10 mile an hour and then the brake was applied.

All of the testing instruments were located outside the testing room, and it is thought that the room became filled with gasoline vapors which ignited, when the engine backfired through the intake, causing the explosion. A leak in the feed pipe is blamed for the room becoming filled with the gaseous vapor.

The monetary loss, in addition to the lives of the four men, was placed at approximately \$10,000, caused by the destruction of the especially built testing chamber, which was a total wreck.

Those killed in the explosion, all of them experienced automotive engineers, were Dr. L. L. Lauer, assistant physicist; James E. Kendig, automotive engineer; W. J. Cook, machinist, and Stephen M. Lee, mechanical engineer, the last named being in charge of the experimental work at the time of the explosion.

Roger Birdsall and F. E. Richardson, two of those injured, were members of the S. A. E. Birdsall was engaged in research work on behalf of the automotive industry, while Richardson represented the army air service in the experimental work.

Following the explosion, Secretary of Commerce Hoover declared that those killed and injured were martyrs to science and that their work would be carried forward. Significant of the explosion was the assertion of the Secretary that when the tests are completed it is expected that the work will result in an annual saving of 500,000,000 gallons of gasoline to the motor riding public.

Columbia Takes Offices in Liberty Motor Plant

Will Hold Distributors' Meeting to Mark Occupancy of New Quarters

DETROIT, Sept. 29.—Columbia Motor Co. established its general offices in the Liberty plant last week and will signalize its taking over the property by holding a distributor convention at which plans for the coming year will be discussed. Manufacture of the Columbia will continue at the present plant until the lease expires. In the meantime the company is getting the Liberty plant ready for manufacturing both the Columbia and Liberty models.

Plans of the company on its manufacturing policy are not ready for announcement, but it is declared the price range on the two models will extend from slightly under the \$1000 mark for open cars in the less expensive models, to approximately \$2,000 in the closed cars of the higher priced line, thus giving its dealers a complete line in the medium priced field. Both lines will be sixes as formerly and will retain characteristics that have become recognized.

Dealers formerly handling the Liberty line will be given opportunity to sell both lines at all points where there is no conflict with the regular Columbia dealers. In all such cases the Columbia dealer will have precedence. In taking over the Liberty, President J. B. Bayerline said, there were found dealer credits, which in most instances had counter claims against them for service parts shipped. These will be adjusted and the amounts to which dealers are entitled will be credited on new cars shipped.

The company plans to communicate with all owners of Liberty cars and will furnish free any service parts which may be required, the owner, however, bearing the cost of the repair work. This is being done to insure the good will of the present Liberty owners, and also to manifest the strength of the Columbia company. In this connection Bayerline emphasizes that Columbia was never in better position than now, both financially and as to manufacturing facilities.

New Durant Plan Said to Require 3 Sets of Dealers

NEW YORK, Oct. 1.—Although it has not been officially announced by Durant Motors, Inc., it is understood that the powers that be have worked out a new distribution problem which will result in three different sets of dealers selling Durant products.

As reports have it the Star and Durant will be hooked up together and be retailed by one set of dealers. The running mate of the \$1195 Flint will be the Eagle Six, which was announced some time ago but which is not yet in production, while the third combination will

be the Princeton and Locomobile. In all likelihood the Eagle, it is said, will be manufactured at the Muncie plant which formerly housed the Durant Six and which was to have been the production center for the Princeton. A change of plans is said to have resulted in sending the Princeton to Bridgeport, where it will be made in the Locomobile factory. As yet only test models have been turned out, but it is thought that the complete line will be ready for the New York show.

In this reported realignment of car units, it is said that Durant has in mind matching General Motors with the Star as the Chevrolet's opponent, the Durant pitted against the Oakland and Oldsmobile; the Eagle battling with the Buick Four; the Flint as a rival of the Buick Six; the Princeton to meet Cadillac competition, while the Locomobile heads the list as the highest priced American car.

Gardner Shipments Last Month Largest Since May

ST. LOUIS, Sept. 29.—During the month of August shipments from the Gardner factory were larger than any month since May, according to an announcement of Russell E. Gardner, Jr., of Gardner Motors, although production in the intervening months was maintained at a high level.

Although there has been active demand for Gardner open models, 62 per cent of the August shipments was composed of closed models and more closed cars were shipped than in any month in the history of the Gardner organization.

It is expected when the final results of the shipments for September are tabulated they will equal the August record and that a higher percentage of closed cars will be shipped than before.

RECEIVER FOR VIM COMPANY

PHILADELPHIA, Sept. 29.—The Vim Motor Truck Co., Roberts Avenue and the Pennsylvania Railroad, has been placed in the hands of a temporary receiver by Judge Charles L. McKeehan, of United States District Court. Kern Dodge, as temporary receiver, will conduct the business in the interest of creditors and stockholders for 30 days and leave has been granted to move for a permanent receiver on 10 days' notice to all parties. The bond is \$25,000.

The Vim company is solvent, its liabilities on Aug. 31 being \$1,301,277.50, exclusive of capital stock liability, and its assets were \$2,468,081.69, but it lacks working capital and overdue accounts have become pressing, according to a bill in equity filed by A. V. W. Surre, of New York, a creditor to the extent of \$5,000. The Vim company, of which Merritt H. Adams is president, consented to the temporary receivership. The company's outstanding capital stock is \$650,000, of which \$150,000 is preferred and \$500,000 common.

Iowa Association Maintains High Membership Standard

Only Seven Out of 40 Dealers in One City Considered Eligible— Must Be Ethical

DES MOINES, Ia., Oct. 2.—In spite of the membership goal of 1,000 members by the end of 1923, set by the Iowa Automotive Merchants' Association, the first aim of the organization is not a large membership, according to A. J. Knapp, secretary-manager. The slogan of the association, "Sincere Service and Selected Membership," will apply even more forcibly than in the past. Commenting on the selection of members for the association, Knapp says:

"Membership selection has been put on an exceedingly ethical basis. A few mistakes have been made in allowing memberships, but these are being rectified and the undesirables are being eliminated. Only those automotive men who can qualify in the eyes of their brother tradesmen as fit candidates for the association are admitted. Prospect lists are being carefully scrutinized before tentative memberships are offered to any candidates. The prospective member must be endorsed by three members of the association in good standing, preferably members in the candidate's own locality. In the case of a candidate who is objected to by a member, the membership is temporarily withheld until a complete investigation is made of the objection. Very few members are admitted over the objections of a member, although the association tries to be entirely fair and to keep personal prejudice from barring anyone from membership."

Any Unethical Conduct by Members Investigated

"Any report of unethical conduct on the part of any member of the association is looked into promptly by a committee, and, if the dealer has been guilty of misconduct along business lines, his membership card is taken away. The aim of the association is to attract only the best automotive men in Iowa, men who will look upon their membership as an honor rather than the expenditure of a small amount for dues. We do not believe that it is necessary to resell this class of business men yearly on the value of the association. Once members, they will want to keep that membership in good standing."

Showing the tendency of the organization to limit its membership to only the best dealers in every county, Knapp cited the case of one Iowa county in which approximately 40 automotive concerns are located. In picking out the firms that could qualify for membership, a committee found that only seven of these 40 firms were desirable as members. Only these seven concerns in the county were tendered tentative memberships.

12-Cylinder Delage Built to Try for Short Distance Speed Records



PARIS, Sept. 18.—(By Mail)—A twelve-cylinder 350 h. p. competition Delage built with the object of attacking all world's short distance speed records, has just been produced and will make its first public display in the hands of Rene Thomas, in the Gaillon hill climb held during the opening week of the Paris Show.

The new Delage is an entirely special job with cylinders of 90 by 140 mm., bore and stroke, these being separate forgings with detachable cast iron heads. There are two valves per cylinder operated by pushrods and rockers. It is intended later to replace the iron

heads by Alpax alloy. Lubrication is of the dry sump type, with three pumps, one delivering oil under pressure to the main bearings, another maintaining a constant level in the troughs, and the third scavenging the base chamber. Three Zenith carburetors are fitted.

The car, which is the most powerful specially designed racing machine in Europe, is beautifully streamlined and finished. The frame members front and rear are profiled, also the front axle, front and rear transverse frame members and the whole of the under portion, including the differential housing.

Not Much Room for Motor Vehicles in Japan's Cities

TOKIO, Japan, Sept. 28.—At the time of the recent earthquake and fire there were approximately 12,500 licensed automobiles in Japan, of which 5,700 were credited to Tokio, a city of 3,000,000 people. In Yokohama with a population of about 400,000 there were about 1,000 cars. It is known that hundreds and perhaps thousands of automobiles were destroyed by the catastrophe. Much talk is heard here among representatives and dealers of foreign-made automobiles of the potentiality of Japan as a market for cars. It is evident, however, from a survey of the situation and existing conditions, that there can be no great demand for automobiles in this country either now or in the remote future.

In no possible way can it be figured that Tokio, Yokohama, Kobe, Osaka, Nagoya and all the other cities and towns of Japan with all their population combined, can, in their present condition absorb as many cars as are sold in a city of 100,000 people in the United States. The reasons are too apparent to leave room for argument, although enthusiastic trade boosters have visions of a removal of the physical, financial and other difficulties that now make Japan almost a nonentity so far as affording a market for automobiles is concerned.

It is not in the cities alone that the narrow, lane-like streets with a width that will not permit the use of an automobile upon them, are barriers to such traffic, but the same condition applies to roads throughout the country, with the exception of a few short runs. It is possible that good roads may in time be built, but to widen the streets, the cities and towns would have to be, in large measure, rebuilt, it is declared.

\$10,000 FOR LOYALTY

DAVENPORT, Ia., Oct. 2.—J. W. Bettendorf, president of the Bettendorf Company, presented a check for \$10,000 to the Bettendorf Loyalty club, composed of members who have been with the firm 15 years or longer, at a lawn party at the Bettendorf home. Half the money will be distributed among the 55 members and the balance held in the treasury for later disposition. Watches were given J. C. Koch and Frank Rueffer, who have been 25 years in the Bettendorf shops.

RICKENBACKER GOES TO EUROPE

DETROIT, Sept. 29.—E. V. Rickenbacker, vice-president and director of sales of the concern which bears his name, sailed last week for Europe where he will attend the Paris Automobile Show which opens Oct. 4. E. R. Evans, chief engineer of the Rickenbacker Motor Co., accompanied him.

Object Lesson in Dealer's 687-Mile Drive in 19 Hours

He Says It Shows How Steady Plugging Beats Bursts of Speed by Powerful Cars

TOPEKA, Kan., Oct. 3.—With the object of proving the practicability of a Ford for long distance trips and that by consistent, steady driving at moderate speed one may make a good time in a small, light car as in a more powerful type, George S. Badders, Ford dealer here, recently completed an interesting test run from Kansas City to Denver.

Starting from the Kansas City post-office in a stock Ford touring car at 5 p. m., he arrived at Denver at 11:50 a. m. the next day, having driven 687 miles in 19 hours and 50 minutes. This time was five minutes less than the schedule of fast mail trains between the two points. Badders was accompanied by L. C. Burns, mechanic in his shop, who relieved him occasionally at the wheel.

Badders reported the car consumed 30 gallons of gasoline and two quarts of oil. One brief stop was made on account of a tire puncture. A stop of 40 minutes was made at Limon, Colo., for breakfast and rest. An interesting feature of the trip was that before starting Badders published a schedule showing his expected time of arrival at 25 towns, including Denver. He actually arrived at Denver at the scheduled time and his time of passing the intervening points adhered very closely to the schedule.

He carried a pouch of mail from the Kansas City postoffice to the Denver postoffice.

Badders states that he strictly observed the speed laws in all cities and incorporated places. His average speed was a little more than 34 m.p.h.

Explaining his purpose, Badders said: "I accomplished what I started out to do—namely, to show that the Ford car is the most practical car in the world for long distance trips; but more than this—that a person can, by consistent, steady driving with a Ford, get over more miles in a day's running than the big cars with their bursts of speed. The big cars passed me, yes, on hard surfaced straightaways, but on the entire trip not a single high-powered automobile stayed ahead. We ran around every one of them on the rough, sidling or curved roads."

URGES HEADLIGHT INFORMATION

WASHINGTON, Oct. 1—Officials of the Bureau of Standards have asked automobile manufacturers to revise their instruction books furnished with new cars in order to include information on adjustment of headlights. The Bureau has also asked for detailed information relating to experiments at the factories on the adjustment of headlights on new cars.

CONCERNING MEN YOU KNOW

Elliott B. Field, formerly of Detroit, has been chosen advertising and publicity manager of the Kissel Motor Car Co. Field has been identified with advertising work in Detroit, prior to which he was connected with the advertising and sales departments of the Burroughs Adding Machine Co.

George W. Tyrol, formerly with J. H. Williams & Co., has joined Bonney Forge & Tool Works of Allentown, Pa., and will be sales representative for Pennsylvania, southern New York, New Jersey and Delaware.

Frank Mayo, for many years president of the Mayo-Skinner Mfg. Co., has been appointed vice president in charge of sales of the Lincoln Products Co., of Chicago, manufacturer Lincoln shock absorbers.

Howard J. Cliff, formerly of the Hart-Parr Co., Charles City, Ia., has joined the Allis-Chalmers Mfg. Co., Milwaukee, as manager of the service department of the tractor division.

E. J. The'en has been promoted by the John G. Wollaeger Co., Milwaukee, distributor of the Studebaker, to be manager of the East Side branch in Milwaukee, at 433 Prospect avenue. He was for six years connected with the main office, now at 2725-2735 Grand avenue.

Ben Linhardt, superintendent of the Lee Tire Chain Factory in Jefferson City, Mo., has been appointed postmaster of Jefferson City. Linhardt has resigned as superintendent of the tire factory so that he can devote all of his time to his new duties.

Charles M. Schwab has been elected a director of the Stutz Motor Car Co. of America to succeed A. F. Cassidy, resigned.

Changes in the personnel of the Black & Decker Manufacturing Co. have been announced. Robert D. Black, Philadelphia branch manager, will return to the factory preparatory to succeeding G. W. Brogan, who retires as advertising manager Jan. 1, to handle his own advertising

agency. H. G. Smith will succeed Black in Philadelphia, E. D. Allmendinger, formerly in Detroit territory, will take charge of the company's export department, and Henry Fox will be sent to Detroit. N. A. Weidmayer, formerly working out of Detroit, joins the industrial department at the New York office. R. F. Mizener also will be in the industrial department at New York, having been transferred from the Ohio territory. T. C. Cornell succeeds Mizener in Cleveland.

Milton J. Budlong, head of York Motors Corp., handling the Ford and Lincoln, has sold his company to Fuller-Luce, Inc., one of the New York distributors of the Ford. Budlong retains the Newark branch of the York company but the new owners will take over the big New York salesrooms at 217 West Fifty-seventh street and also will open a new service station at 503 West Fifty-sixth street, which will service Lincoln cars. Budlong has not announced his future plans.

Joseph N. Kellerman, sales manager of the Hudson-Frampton Motor Car Co., St. Louis, accompanied by Mrs. Kellerman and two Hudson-Frampton salesmen, went fishing at Hunt's Farm on the Black River last week. According to the fishermen they landed 82 bass in four days and returned to St. Louis with 50 which they proceeded to use upon prospects as a sales argument.

B. J. Grigsby, president of Grigsby-Grunow-Hinds Co., Chicago manufacturers of automobile accessories, has sailed for a two months' visit in England, France, Belgium and Holland in connection with the interests of the company.

A. E. Young, zone manager of the Janesville, Wis., district of Chevrolet, has been promoted to zone manager of the Flint, Mich., district. Employees of Chevrolet factory at Janesville tendered him a dinner and presented him an engraved watch, the presentation being made by Bert F. Anger, Chevrolet distributor in the Milwaukee territory.

Durant Has Surprise Up His Sleeve, He Tells Dealers

DETROIT, Sept. 29.—Speaking to a meeting of 150 distributors of Durant cars at the Lansing plant this week, William C. Durant spoke of changes which he plans to make in one or more of the cars now being manufactured. Some big surprises were promised, but no details of the changes would be released for publication. The distributor session lasted two days.

It is understood the changes will be principally in the bodies, a new and better type being planned which will be strengthened throughout.

NEW WILLYS-OVERLAND PLANT

PHILADELPHIA, Sept. 29.—The Willys-Overland Co., of Toledo, will open an assembling plant here in the near future, with initial capacity of 200 cars daily. The company has leased the 14-acre plant of the George W. Smith Co. Inc., at Forty-ninth street and Botanic avenue, and the Schuylkill river. Operations will begin Jan. 1.

The plant will be the base of supply for the company's Eastern district. It was constructed during the war as a woodworking establishment and is situated on the Reading, the Pennsylvania and the Baltimore & Ohio railroads. There is considerable space adjacent for expansion. One factor in the selection of Philadelphia as the Eastern assembling plant is that the Budd Manufacturing Co. is located here and this concern supplies Willys-Overland with steel bodies.

CHICAGO TRIES SIGNAL TOWERS

CHICAGO, Sept. 29.—The synchronized system of traffic signal towers on Michigan boulevard from Randolph street to Twenty-second street was put in operation this week. It is hoped that this will facilitate movement of automobiles on Michigan boulevard which is daily carrying more and more motor traffic. The system was installed by John Hertz, president of the Yellow Cab Co., with the permission of the South Park Board, the agreement being that if the system proves successful the park board will reimburse him; otherwise he will remove the system at his own expense.

VESPER ENTERTAINS N. A. D. A.

ST. LOUIS, Sept. 29.—F. W. A. Vesper will entertain St. Louis members of the N. A. D. A. at luncheon at Fredmar Farms, at which time the fall program of the activities of the association will be presented by C. A. Vane, general manager of N. A. D. A.

Plans will be made at this meeting to insure the attendance of between 800 and 1000 automobile dealers in Illinois, Missouri, Kentucky, Iowa and Arkansas at the district meeting of the N. A. D. A. to be held in St. Louis, probably Dec. 10.

NOW WATCH THEM SELL

DETROIT, Sept. 28.—Salesmen who exceed their quotas of used car sales at the Detroit branch of the Studebaker Corp. of America will receive as prizes winter overcoats. The quotas have been fixed by agreement with the salesmen. Sales of used cars at the branch have been in excess of new car sales.

Railway Crossing Accidents More Than Double in Year

Pennsylvania States Deaths of Motorists on Its Line in July Were 46 Compared With 21 Year Ago

NEW YORK, Oct. 2.—In July there were 46 persons killed and 39 injured in automobile accidents at grade crossings of the Pennsylvania Railroad as compared with 21 killed and 35 injured in July, 1922, an increase of fatalities of 119 per cent.

Which leads the company to comment as follows:

"Study of these accidents powerfully emphasizes the fact that many persons are driving motor cars who are not only helpless in emergencies but also totally fail to realize their responsibility for protecting from death and injury those who ride with them. The contrast between this condition and the rigid rules and regulations of railroad companies with respect to their locomotive engineers is thus brought out in the Insurance Department's report:

Compares Driving Regulations

"For safety reasons the railroads do not permit any one excepting those on duty to ride with a locomotive engineer, and persons who have business on engines are forbidden to distract his attention. It is frequently seen that automobiles and trucks are filled to capacity and the drivers are so crowded that access to the brakes and gearshift levers is impeded; the conditions under such circumstances may be so distracting that when an emergency arises, a crash is likely to occur as a result of this interference. If similar conditions existed on passenger locomotives disastrous wrecks probably would be as numerous as crossing accidents.

"The Pennsylvania Railroad System often has been operated an entire year without a passenger being killed in a train accident, but it is likely that if locomotive engineers treated their responsibility for the safety of passengers as lightly as do many drivers of automobiles, this record could not have been made."

PACIFIC COAST HIGHWAY OPENED

SAN FRANCISCO, Sept. 29.—"Pacific Avenue," a broad highway reaching from the Mexican to the Canadian border and running along the Pacific coast, is now open for traffic, all of it paved with concrete with the exception of a few miles between Redding, in northern California, and Ashland, in southern Oregon. This link will be paved this fall. The southern terminus of the highway is Tia Juana, Mexico, and the northern end is in Vancouver, British Columbia. It passes through territory in which live more than 6,000,000 people and touches almost every important center of population on the Pacific coast. These six million people own 1,500,000 automobiles, or more.

BUSINESS NOTES

Johns-Manville Co., which for many years maintained its main factory and general offices in Milwaukee, and is now occupying its new works at Waukegan, Ill., has sold its main office building at Second and Sycamore streets, Milwaukee, to Gimbel Bros. It is establishing a distributing branch on West Water, between Grand avenue and Sycamore streets, for automotive and other products.

The Mid-West Automobile Accessories Mfg. Co., organized with \$50,000 capital at Green Bay, Wis., will specialize in making metal and fabric hood and radiator covers. Ralph Davis is in general charge.

The Glancy Malleable Corp. of Waukesha, Wis., recently incorporated, has taken over extensive leased holdings of General Motors at Waukesha and Janesville, Wis., and will continue to handle large contracts for malleable parts for various divisions of the corporation.

Lawrence Process Co., 3001 Commerce street, Dallas, Tex., specializing in cylinder and crank-shaft grinding and distributing pistons, pins and rings, with plants in several cities, has been reorganized. The following new officers were elected: President, Pierre Schon; vice-president and manager, F. W. Ellison; secretary and treasurer, F. A. Levilloux; sales manager, Harry E. Scott; superintendent, E. A. Cole. Schon also is president of the G. M. C. company, recently organized at Shreveport, La., to distribute General Motors trucks. The company has adopted a new guarantee policy covering all its work.

Philip Matter, receiver for the Western Drop Forge Co., Marion, Ind., involved financially because of the Dolligs failure, advertises that the company's ground, factory and equipment will be sold Oct. 22. It is understood that efforts will be made to sell the plant intact. At the time of the appointment of the receiver the company employed about 500 workmen.

The address of J. H. Brozek, representative in Detroit of the Eco Motors Co. of Melbourne,

Australia, is 2366 Denton avenue, instead of 3566 Denton avenue, as misprinted in a recent issue of MOTOR AGE.

The combined sales forces of the Perfection Spring and Cox Bumper divisions of The Eaton Axle and Spring Co. held an important meeting in Cleveland Sept. 24 and 25, the first meeting of the kind since the merger. About 60 men were present, including branch managers and salesmen from every district in the country.

India Tire & Rubber Co. reports its volume of business in both units and dollars in August was the greatest of any August in its history and next to the best month's business of the company in the last five years. The directors on Sept. 11 declared the usual dividend on common and preferred stock.

The C. B. Shepard Co. has been formed in Detroit by C. B. Shepard, to engage in the manufacture of automobile hardware. Shepard formerly was owner of Shepard Art Metal Co., which later became a subsidiary of Fisher Body Corp., and which recently was made a division of Ternstedt Mfg. Co. At the time of the latter change Shepard's resignation was announced. It being understood at that time that he contemplated formation of the new company. C. B. Shepard Co. has taken over the former Armstrong Tanning Co. plant in the southeastern part of the city.

The Armature Rewinding Co., St. Louis, will occupy a two-story building at Leonard avenue and Washington boulevard to take care of its increasing business. The firm was incorporated in July, 1922, with C. M. McCord as president and R. L. Probst, secretary and treasurer.

The Cedar Rapids Auto Supply Co., incorporated last winter to take over the automotive department of the Cedar Rapids Pump and Supply Co., is now located in its new building at 615-19 Second avenue, East Cedar Rapids, Ia. The new building of brick and concrete is of three story construction and has floor space of over 25,000 sq. ft. available.

Success Attends Dealers' Participation in Fairs

SPRINGFIELD, Mass., Sept. 28.—Automobile dealers are taking a more important part this season than ever before in the larger fairs of Western New England, and the success attending these exhibits attests forcibly the improved interest and buying power of the farmers.

At the Eastern States Agricultural & Industrial Exposition which opened here Sept. 16, the automobile show was for the first time under the charge of the New England branches and distributors centering in Boston, and some very handsome displays are being presented and keen interest manifested. The fair at Greenfield carried a well-arranged exhibition of more than 100 cars and trucks by the Franklin County Automobile Dealers' Association, who made it the occasion of their annual show and signed up a generous string of orders through their display of the new models.

At the Twin State fair at White River Junction, Vt., the automobile building erected a year or two ago proved inadequate and an overflow exhibition was arranged. At the Valley Fair in Brattleboro plans are laid to turn the occasion to good account for the dealers.

ACCESSORY DEALERS ORGANIZE

BALTIMORE, Md., Sept. 30.—For the purpose of bringing about a better feeling among the members and to work for improvements in the business in general, a number of the garage owners and accessory dealers of this city have formed

the Garage and Accessory Dealers' Association. More than 80 of these engaged in the trade in Baltimore attended the last meeting, held at the Hotel Southern, and the officials believe that by the next meeting the membership will pass the 100 mark.

Several weeks ago some of those engaged in the business got together and discussed the formation of an organization. Three attended that meeting. News of the second meeting was passed around and this was attended by 10. The third meeting, held a few days ago, saw more than 80 present. Officers have been elected and preliminary steps toward incorporating have been taken. The officers are: William H. Claire, of W. H. Claire & Co., president; Seth H. Linthicum, of the Foster Garage, vice-president; P. J. O'Brien, of O'Brien Bros., treasurer, and M. B. Corsuch, secretary.

OVERPRODUCTION OF GASOLINE

ST. PAUL, Sept. 29.—Overproduction of gasoline is declared to be responsible for the recent break in prices, according to the testimony of John D. Clark, first vice-president of the Standard Oil Co. of Indiana, before the commission appointed by the State to investigate the price of petroleum products. Clark also declared that, although the present quotation of 16.9 cents is below the cost of refining, his company is not losing money on its current sales because of the profits derived from the by-products.

Clark also declared that gasoline prices in Minnesota probably will remain unchanged for several months and further reductions may follow.

Hispano-Suiza Maintains 70 M.P.H. in 278-Mile Road Race

Only Seven Out of 23 Starters Finish in Notable Spanish Event Won by Chenard-Walcker

PARIS, Sept. 28.—Driving a six-cylinder four-passenger sporting type Hispano-Suiza, Garnier, an automobile dealer of San Sebastian, averaged 70.7 miles an hour in the 278.5-mile road race for the Georges Boillot cup held at Boulogne this week. Boyriven, on a similar Hispano-Suiza, was second, 25 minutes, 38 seconds behind the leader.

Although putting up the fastest time, the Hispano-Suizas lost the Georges Boillot cup, on a handicap basis, to Pisart, a Chenard-Walcker dealer, who carrying his wife as "mecancienne," averaged 58.2 miles an hour with a 138 cubic inch four-passenger Chenard-Walcker.

This race was remarkable for the high percentage of failures to finish. Of the 23 starters, only 7 went the entire distance. Jean Chassagne, driving a Hispano-Suiza, dropped out on the initial lap with a broken ball bearing in the distributor drive. Another Hispano-Suiza ran off the road. Clement, on an English Bentley, broke a piston. Coe, on an English Vauxhall, was forced out with a broken timing chain when leading the race on the handicap allowance. Four Bignans, one of them driven by Albert Guyot, went out with lubrication troubles.

André Boillot lost the gasoline tank off his Peugeot. Another Peugeot went out with lubrication troubles. Duff's Bentley caught fire five times and could not finish within the time limit. A Ford with a special Montier cylinder head failed to finish in the time limit. An unusual fatal accident marked this race. Boyriven's Hispano-Suiza, skidding on the car lines, pulled a clincher bead tire off the rim. The tire struck a spectator on the head, killing him instantly. Results:

Garnier, Hispano-Suiza	3:55:48	1/5
Boyriven, Hispano-Suiza	4:21:26	1/5
Pisart, Chenard-Walcker	4:46:47	1/5
Morillon, Peugeot	5:04:22	3/5
Lagache, Chenard Walcker	5:11:35	2/5
Kensington Moir, Bentley	5:20:50	
Elgy, Bignan	5:25:00	

VANE AT BALTIMORE

BALTIMORE, Md., Sept. 29.—C. A. Vane, general manager of the National Automobile Trade Association, will speak before the trade association of this city on October 9. The subject of his address will be "Automobile Dealers' Profits—What They Are, Where They Go and Why."

GOODRICH LISTS BALLOON TIRES

AKRON, Sept. 29.—The B. F. Goodrich Co. has officially listed balloon tires and quotes the following consumer's prices: 28x4, \$25.35; 30x5, \$30.70; 32x6, \$42.85; 34x7, \$68.55.

IN THE RETAIL FIELD

Comerford Motor Car Co., Fond du Lac, Wis., has been organized as a corporation with \$25,000 capital to take over the Oldsmobile dealership of the Bush Motor Co., together with its headquarters at 19 Fourth street. H. G. Comerford, president and general manager of the new concern, formerly was with the Dashiell Motor Car Co., Chicago, and later with the Flint Motor Car Co., Milwaukee, state distributor of the Oldsmobile.

H. W. Eckert Sales Co., 210 Main street, Oshkosh, Wis., has been appointed Stearns-Knight dealer in Winnebago county.

King-Braeger Co., Milwaukee, has been incorporated with \$50,000 capital stock to become an additional Chevrolet dealer under the Anger-Chevrolet Co., territorial distributor, and has opened a sales and service headquarters at Eleventh and National avenue.

P. B. Hustis, Case dealer in Milwaukee, has moved into his new and permanent sales and service building at 496 Van Buren street, corner Biddle street.

Bogda Chevrolet Co., Stevens Point, Wis., has completed its new sales and service headquarters building at 303 Strong's avenue.

Lemm Electric Co., 1242 Fortieth street, Milwaukee, has let contracts for the construction of a new automotive electric and battery service building, 30 x 85 x 55 ft., two stories, at Thirty-fifth street and Fond du Lac avenue.

Valley Inn Buick Co., Neenah, Wis., has been incorporated for \$25,000 by Leslie H. Bleeker, Howard P. Buck and John O. Kuehl, to take over the Bleeker dealership in the Buick.

The Buick Automobile Co. of Trenton, Mo., is moving into its new building in that city.

New agents for the Hudson and Essex have been appointed as follows by J. S. Harrington, Inc., of Springfield, Mass.: W. J. Hickey, Great Barrington, Mass.; W. D. French, Sheffield, Mass.; C. W. Brown, Ludlow, Mass.; James D. Knight, Thompsonville, Conn.

Stanley Jeffries of Mammoth Springs, Ark., and C. W. Dixon have opened a garage and service station in Clinton, Mo., and will have the agency of the Chevrolet cars.

John H. Sutton has been appointed sales manager by the Curran-McDevitt Motor Co., Inc., Philadelphia distributor for Mercer and Davis cars. He has been associated with McDevitt for six years.

The Traylor Motor Co., Philadelphia, has been appointed distributor of Gardner cars, at 252-254 North Broad street.

Utterback-Gleason Co. of Boston has been appointed Kissel distributor for that territory.

Roland Oakland Co., Eau Claire, Wis., has been incorporated with \$11,000 capital, as distributor of the Oakland in Eau Claire, Chippewa, Dunn and parts of six other northwestern Wisconsin counties. Sales and service quarters have been established at 315 Eau Claire street. I. B. Roland is president. Arthur B. Nelson, formerly with the Northwest Wisconsin Overland Co., is sales manager.

The Springfield Motor Corporation has taken the agency for the Courier in Springfield, Mass.

John E. Smith, proprietor of the Last Chance Garage at Clinton, Mo., and Miss Effie Bush of the same city, were married recently.

The Bell-Beach Garage at Fayette, Mo., has been sold by O. E. Beach to Horace Bell, Arthur Bell and Mrs. Ida Kardell, all of St. Louis, and the three new owners have taken possession. George Clickner will act as manager of the establishment for the present.

A. A. Smart has purchased the interests of his partner, Lloyd Franklin, in the Buick agency and garage at Cameron, Mo., and is now the sole owner.

Harry Blackwell has taken over the Hudson and Essex agency in the territory adjacent to Jefferson City, Mo. Lee Shadwick has been taken in as a partner in the business.

The following new automobile companies have been formed in the southwest the past ten days: Muscle Shoals Motor Co., Sheffield, Ala., \$15,000 capital; Turrentine Motor Co., Tarboro, N. C., \$50,000 capital; Brooks-Sauser Auto Service Co., Jacksonville, Fla., \$10,000 capital.

Davis Chevrolet, Inc., is the name of a new Chevrolet dealer and distributing firm at Baton Rouge, La., with \$30,000 capital. William M. Davis, of Baton Rouge, is president, and D. E. McInnes, Jr., is secretary and treasurer.

Theodore H. Spiegel, who has taken over the Fred Couve implement agency in Kewanee, Ill., will handle the entire J. I. Case line, including the Case automobile.

The Kelly Tire Sales Co., 133 West Seventh street, Dubuque, Iowa, has taken the agency for the Auburn car.

J. O. Huffman of the Huffman-Buick Co., Kewanee, Ill., has sold his interests to Gus Kirby and Emmons Koppitz. Huffman, who was a veteran automobile man in that section of the state, is removing to Denver.

Nathan Langellier, for the past year manager of the Elgin, Ill., Used Car Exchange, has resigned to resume the distribution of new cars. He will be at the head of the Oakland Sales Co. with sales agency and service station at 204 River street, Elgin. He has been for 12 years in the automobile business in Elgin. When the Elgin dealers decided to open the used car exchange in the fall of 1922, he was chosen for manager and the business has been successfully handled since and with profit to the various firms represented.

C. Markland Kelly, who has wide experience in the automobile business, has been made sales manager of the Neill-Buick Co., Baltimore.

Francis Frazier has been appointed manager of the Missouri Motor Co. at Fayette, Mo., succeeding Tom Hunton, who has been manager of the firm since it commenced business in Fayette. Hunton has been given a place with the same company at Columbia, Mo.

The Auto Sales Co., 3027-31 Olive St., St. Louis, has been appointed an Oakland dealer by the Mississippi Valley Motor Co., Oakland distributor. William H. Shaw, president of the St. Louis Auto Tire Co., is president of the new concern, and William Schreiber, who has been associated with the automobile industry in St. Louis for a number of years, is vice-president and general manager.

The Johnson-Wright Motor Co., recently authorized as a Ford, Lincoln and Fordson dealer in St. Louis, announced the formal opening of its showroom at 3929-31 Laclede avenue, recently. W. R. Johnson, assistant manager of the St. Louis Ford branch for six years, is president and treasurer of the company, and Harry C. Wright, chief road man of the Ford branch for four years, is vice-president and secretary.

J. E. McKeown, connected with the Ford Motor Car Co. in St. Louis as service manager for three years, has purchased the Ferguson Motor Co., Ferguson, Mo., from A. C. Wilson, who is retiring, and under the name of the McKeown Motor Co. will handle the Ford in Ferguson. He will retain the present salesroom at Florissant and Darst roads.

The Adams-Sayre Motor Co., Ironton, O., has been chartered with a capital of \$25,000 to buy, sell and deal in automobiles, trucks, parts and accessories.

The Dayton Federal Truck Co., Dayton, O., has been incorporated with a capital of \$10,000 to buy, sell and deal in automobiles, trucks, parts and accessories.

Smith-Sauer Motor Co., 2436 South Michigan avenue, Chicago, has been appointed selling agent for the Case automobiles for the states of Michigan, Ohio, Indiana, Illinois, Missouri, Kansas, Nebraska, Iowa, Minnesota and Wisconsin.

Parkview Motors Co., Hupmobile and Case dealer at Sacramento boulevard and Grand avenue, Chicago, has had plans drawn for a large addition to its present plant.

Jackson Park Buick Co., Chicago, has occupied a new building at 7134 Stony Island avenue.

The George Marquette Motor Sales Co., 5971 Ridge avenue, Chicago, has taken the dealership for the Jordan, Willys-Knight and Overland, in addition to the Peerless.

The Pyramid Motor Co., Ford and Lincoln dealer at Charlotte, N. C., has bought a lot at a cost of approximately \$75,000 and will build a new garage. The new building will be approximately 138x200 ft., three stories, brick and steel construction. The company owns its present location but finds it necessary to move in order to take care of its growing business.

Riverside Motor Co., Inc., of Columbia, S. C., has obtained a charter for a general automobile business. Capital stock is \$25,000. Sam T. Carter is president of the company.

Harden Motor Co. of Newberry, S. C., has been chartered for automobile business, handling the Buick car. C. R. Adams is president and C. D. Harden treasurer.

Wadsworth & Sehorn, distributor for the Reo car in Western North Carolina and upper South Carolina, has made contracts with four new dealers within the last few weeks. These dealers are J. O., and A. L. Breedin, Bennettsville, S. C.; Erskine Motors Co., Anderson, S. C.; J. D. Hunt-Winston-Salem, N. C., and The Motor Co., Greensboro, N. C.

Among new Nash dealers are the following: F. B. Farrow, Tucson, Arizona; P. A. Bugg, Blytheville, Arkansas; Hot Springs Garage, Hot Springs, Arkansas; Nash Sales Co. of Glendale, Glendale, California; Moore & Pegg, Los Angeles, California; Don Cann, Los Angeles, Calif.; Nash-Nicolls Motor Co., Long Beach, Calif.; East San Diego Nash Co., San Diego, Calif.; H. V. Bryant, Chula Vista, Calif.; McDowell & Striplin, Columbus, Ga., and Stevens Nash Co., Valdosta, Ga.

Articles of incorporation have been issued to the Seggebruch Auto Sales Company, 1646 Vincennes avenue, Chicago Heights, Ill. Capital stock has been fixed at \$30,000. The company will distribute motor vehicles and accessories.

W. H. Litzenberger, Galesburg, Ill., has opened a new garage and sales agency at 230 West Simons street, to be known as the Galesburg Garage. The building is 32x100 ft and fireproof.

The Barrows Motor Car Company, Gibson City, Ill., has given up the distribution of the Buick car in the Ford county territory and has taken up the distribution of the Nash car. H. S. Hedderson of Champaign, Ill., Buick distributor, will take over the Ford county territory.

Manning Motor Co. has been formed to handle the Chevrolet in Franklin Co., Mass., with headquarters in Greenfield. William J. Manning of Deepfield heads the concern.

The Auto Store has been opened at 107 East Fifth street, Pittsburg, Kan., by R. L. Kelly. This store handles a complete line of automotive accessories, supplies and replacement parts.

The Durant & Star Sales Co., 217 W. Depot Ave., Knoxville, Tenn., is a new company recently formed to distribute the Durant and Star line in East Tennessee, according to an announcement by E. P. Nicholson, who is president of the new company.

Purcell-Wischan Co., Madison, Wis., Reo dealer, has changed its style to Purcell-Bluteau Co., upon the completion of a new sales and service building costing \$150,000 at 434 West Gilman street. P. J. Purcell is president and general manager. W. L. Bluteau is a new member of the firm, assuming the Adolph Wischan interest.

"Bill's Accessory Shop", at the corner of S. Third and Union avenue, has lately opened at Memphis, Tenn.

The Harris-Buick Co. of 142 W. 7th street, East Liverpool, O., has been chartered with a capital of \$10,000.

The following dealers have been appointed to handle the Nash: The Coeur d'Alene Nash Co., Coeur d'Alene, Idaho; Meeker & McDonald, Bonners Ferry, Idaho; Baker Nash Auto Agency, Quincy, Ill.; Geo. E. Burmeister, Blue Island, Ill.; Jefferson Nash Co., Chicago, Ill.; Adams County Nash Co., Berne, Ind.; Oliver's Garage, Attica; Replogue Nash Co., Union City, Ind.; E. C. Wittman, Humboldt, Ia.; Nash Sales Co., Emmetsburg, Ia.; Kruse & Moore, Tipton, Ia., and The Detroit Garage, Donaldsonville, La.

(Continued from page 33)

ing vehicular communications between different parts of the city. There is also a set of pictures showing the New York-New Jersey vehicular tunnel under the Hudson River, now being constructed. A collection of photographs and maps contains effective propaganda for playgrounds so that traffic accidents involving children may be minimized.

The educational exhibit, as a whole, is intended to encourage public consideration of the city's need for additional and improved motor trafficways, a movement obviously vital to the future of motor transport and the automotive trade in the metropolitan area.

MAT COMPANY MOVES

PADUCAH, Ky., Oct. 1.—The management of the Mat Company, formerly of Muskegon, Mich., manufacturer of door mats, Ford tonneau mats and running board mats, all Coco fibre products, announces the removal of the factory and general offices to Paducah. They are perfecting a new organization, under the laws of the state of Kentucky and capitalized at \$30,000. The company is open for business.

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

Crankcase Oil Can Be Reclaimed

Q—Can you tell us of any method or equipment for reclaiming old crankcase oil, or anyone manufacturing such equipment, and whether in your opinion it can be done successfully. We are informed that about four or five years ago something along these lines appeared in MOTOR AGE.—Warde Johnson, Great Falls, Mont.

An article on this subject appeared on page 23 of June 29th, 1922, issue of MOTOR AGE, and it was again discussed in the Clearing House on page 42 of the May 31, 1923, issue. For the benefit of other readers who are interested in the question, we repeat substantially the article which appeared in the Readers' Clearing House.

Limited Use for Reclaimed Oil

The question of oil purification should be considered on the basis of quantity and how the oil will be used. If the oil is intended for resale, it is usually a difficult problem as the reclaimed oil has a dark appearance which makes the car user suspicious. While the reclaimed oil may have lubricating qualities superior to those of new oil, it nevertheless, has this dark color which often makes it hard to sell. Reclaimed oil is chiefly used by large engine builders where it is used for its value rather than its appearance.

One separator used for this purpose costs \$1,300, and is capable of handling 100 gallons per hour. However, this device merely takes out the dirt, water and carbon, but does not remove the gasoline and kerosene. Name of concern making this device will be given by letter.

Still to Remove Gasoline and Kerosene

For removing the gasoline and kerosene, some sort of still is required. In such a still it is necessary to have a steam coil which is capable of heating the oil up to 400 or 600 degrees, at which point the gasoline and kerosene will be driven off to a great extent. If it is desirable to recover these it is then necessary to lead the vapor through cooling coils so that they will be condensed.

One type of still can be made using a steam coil, while another type can be made in which the steam coil has small holes so that the high pressure steam escapes and bubbles up through the oil, agitating it considerably. It is this type of still which was described in the June 29, 1922, issue of MOTOR AGE. For a small establishment or even a medium size one, it might be advisable to have the still made up by some boiler shop and use the method described in MOTOR AGE article just mentioned. The ordinary reclaimer will not work well if the old oil

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks later, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

has mixed with it any 600 W or cup grease, accordingly the used oil should be selected with care.

The boiler used in making the still should be insulated so as to hold the heat. Passage of steam through the oil should continue for about three hours. About half an hour before the three-hour agitating process is finished a quantity of Gold Dust should be thrown on the surface of the oil. When the steam is turned off, the contents are allowed to stand for ten hours. During this standing period the gold dust, which has an affinity for the foreign matter in the oil, settles to the bottom of the vessel and with it the sludge which has been removed.

At the end of this time water is carefully admitted at the bottom of the still and raises the level of the oil and sludge. The oil is first skimmed off. When the oil has been removed, the next layer to be removed is the sludge which is thrown away, and this separating process is possible, due to the different densities of the oil, sludge and water.

Average Car Generator Will Charge Not More Than Two Batteries

Q—I am thinking of using some old make of car generator connected to a motor for battery charging. What make of generator would charge the most batteries, and which would be the best, a Gray & Davis with governor regulation, or a 12-volt North East? On what make of generator could I use a rheostat in the field to control the output in place of the automatic regulation? What make of generators are compound wound?—J. A. House, Dyer, Tenn.

There is not much choice as to the generator you will use. Most any 6-volt generator can be used, but is satisfactory for charging one 6-volt battery at a time only. A North East generator from a Dodge car can be used to charge one 12-volt battery at about 9 amperes or two 6-volt batteries in series at the same ampere rate. The ordinary 6-volt machine will overheat if you try to charge two 6-volt batteries in series or a 12-volt battery.

To give you a list of all of the generators which use the compound winding would be too much of a job for us. Practically all of the makers of electrical equipment have put out compound machines at one time or other. However, if you do not find a third brush on the machine and it is not used with an external vibrating regulator it is quite probable that it has a series winding as well as a shunt winding and is therefore a compound machine.

You can put a rheostat in the shunt field of practically any automobile type generator and the ordinary rheostat used for radio work is doubtless suitable for this purpose. You should drive the generator at such a speed that the output will be about 15 amperes and then use a rheostat in the circuit of the shunt field so that, when a battery is pretty well charged, you can cut the current down. The best thing for you to do would be to take a generator that is known to be in good condition and then if you get into trouble with the circuits describe the generator to us and we will be glad to furnish any possible assistance.

If the old governor type Gray & Davis generator is used, the slipping clutch feature should be eliminated for the sake of simplicity.

FLAT RATES

The sixth article in this series, page 19, discusses simple record forms.

Architectural Service

In giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

Dead Storage in Dark Side of Building

Q—We enclose, as one of your subscribers, sketch of proposed service station. We have noticed from time to time the diagrams and plans of suggested service buildings. We contemplate putting up a service building as laid out on the enclosed sketch. The red line shows the outside boundary of the property and the blue lines show the building that we are now ready to construct.

You will notice in front of the blue plot, a square set aside for a proposed sales department which is to be erected at a later time. We have marked on the sketch such information as we feel you may need in laying out your plans. We are not fully decided whether it is best for us to use an elevator or a ramp. If a ramp is used we would like the same constructed outside the building at the rear end of the lot.

Will you please hand this to your architectural service department and send us the plans as soon as possible. We thought perhaps your practice was to wait the next issue of the Motor Age and in such issue publish the sketch. As we want to get sketch at the earliest possible moment, we ask you to send us same by mail.

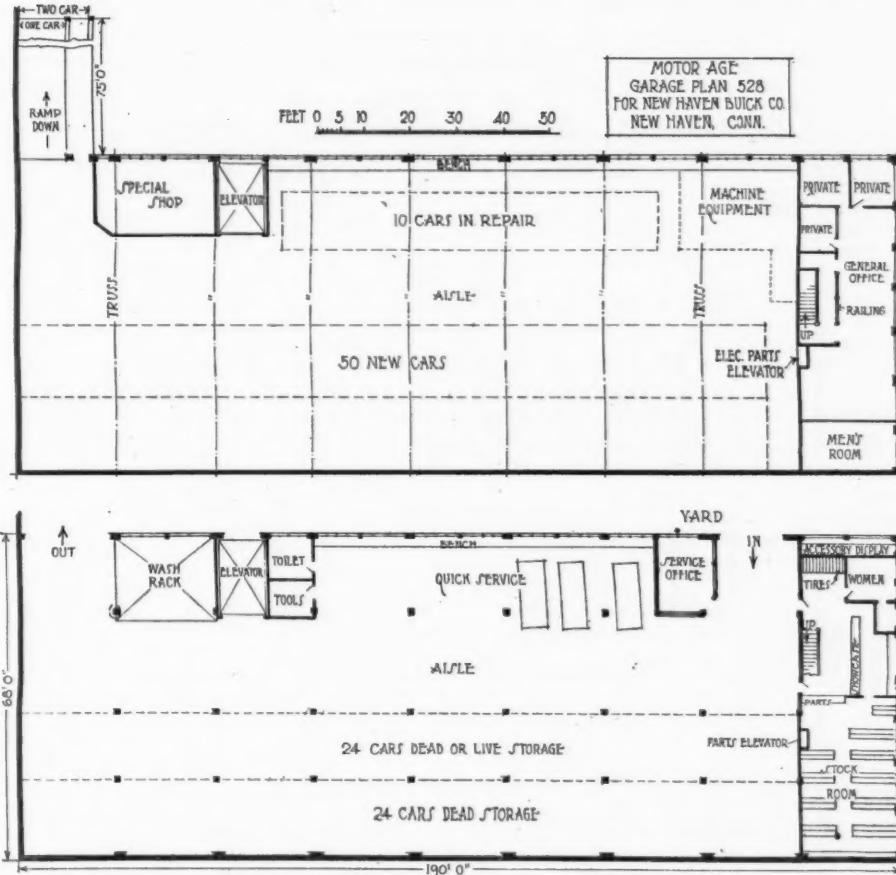
If there is any further information that you may desire, we would be very glad to have you call upon us.—New Haven Buick Co., New Haven, Conn.

A—We have made a layout for your proposed service building and while it does not conform exactly to the suggestions on your sketch, we believe that it will work out better.

You have indicated that you desire to use the front end of the building for dead storage on both floors, while you wish to use the back part on both floors for service. Since you only have light on one side, this side of the lower floor would be suitable for service. Consequently, we have arranged to have the dead storage in the dark side where it is best suited for this purpose.

With the stockroom, accessory store and general office occupying the extreme front end on both floors, you have a very good arrangement in this way. Cars wishing service may drive in as indicated past the service office, getting estimates for quick service assistance, and either drive out at the back entrance or being taken by the elevator to the second floor.

The only objection we can see to this arrangement is that the new cars distributed along the whole length of the building will be more or less apt to receive



injury from cars passing through, but we do not believe this is a very serious feature, because most of the time the space will not be full of new cars so that the front row would, undoubtedly, be empty, giving more working space or affording space for the storage of transients, demonstrators, etc.

We should imagine that in a building of this sort you should have an elevator

even if you do build a ramp. It is our opinion that the elevator would be the better of the two, that is, if you intend only installing the one. If you were contemplating a storage business on a large scale the ramp would, undoubtedly, be the best proposition.

This layout should make a very complete plan when you have it all finished including the sales department.

MORE HEAT WANTED HERE

Q—Do you believe an oil ring will do any good on a Waterloo Boy tractor? This job has been reground and new pistons and rings fitted and it still pumps oil, and allows gasoline or kerosene to go back into the crankcase. It is the source of much worry and anything you can tell us that will help will be appreciated.—Western Machine & Grinding Co., Iowa City, Iowa.

The burning of kerosene and even the efficient burning of gasoline today depends on the use of a hot-spot manifold. The tractor in question is provided with such a manifold where the exhaust gases are used to heat up the intake passages. It occurs to us that possibly this manifold has not been cleaned for a long time and may have a coating of soot and carbon which prevents the exhaust gas from efficiently heating the intake portion of the manifold.

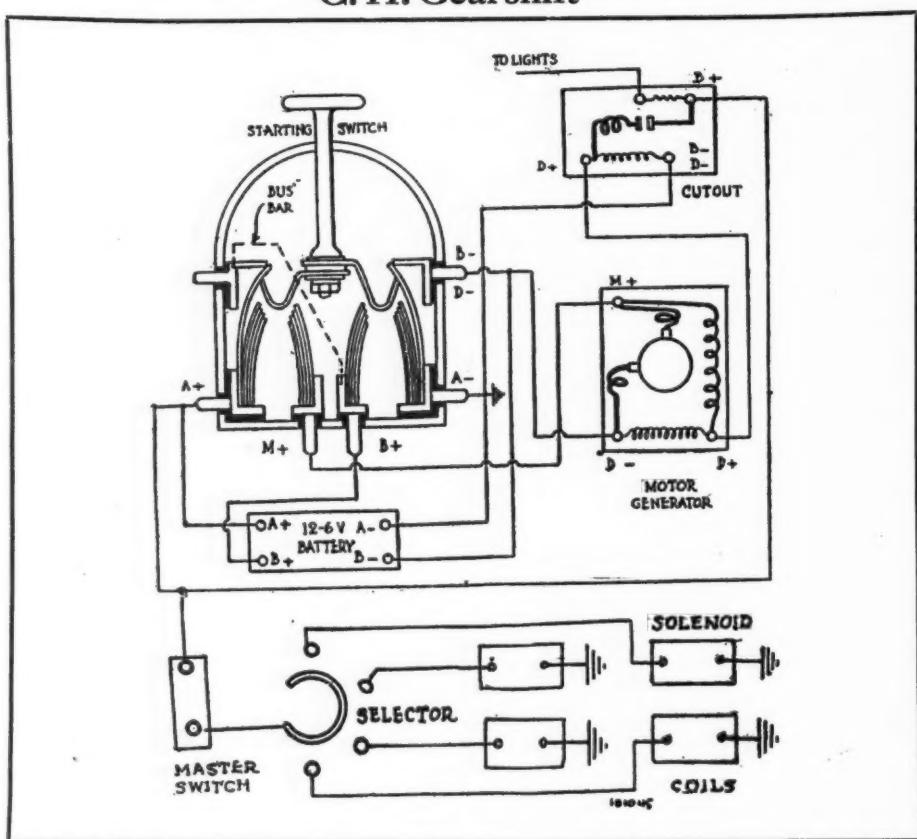
In the operation of this tractor the engine should be started up with the three-way lever, on the three-way cock, turned in the direction of the gasoline line which allows gasoline to flow to the carburetor. After the engine has become thoroughly heated, the lever may be turned to the up position which allows

kerosene to flow into the carburetor. It is possible that the lever is turned to the kerosene position too soon and this may account for some of the trouble. Then when the operator is nearly ready to shut down, the lever should again be turned to the gasoline position so that when stopped the carburetor bowl will be full of gasoline, and ready for the next start.

Another possibility is that the valves are not perfectly seated and after grinding them they should be tested by using Prussian blue or making marks on the valve with a pencil. The valve can then be placed in the seat and turned a quarter turn to see if all of the pencil marks are rubbed off.

Many engines today are made with pistons which have holes bored in them so that the surplus oil scraped from the cylinder walls may drain back into the crankcase. A method of doing this, as used by one motor car manufacturer, was shown on page 44 of the August 16, 1923, issue of MOTOR AGE, and we would suggest your referring to this issue, as bleeding the piston in this way may overcome the trouble.

Complete Wiring of Pullman Model 4-1917 With C. H. Gearshift



Q—Send wiring diagram for a model 4, 1917 Pullman special roadster, factory No. T 9,198, engine No. 6,191. This car has an electric gearshift and the name on the generator is Apple Electric Co., Newark, N. J. The trade mark is Appleco and the model is A25, 12 volts. The plate on the side of the engine shows motor parts No. 5190 model EMC. There has been a mixup in the wiring of this car and we find it very difficult to solve.—R. J. Ahern, Cresco, Iowa.

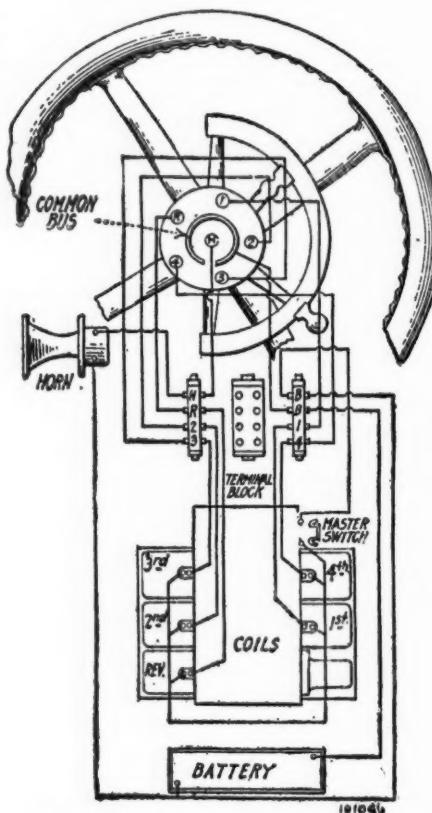
We are showing two illustrations, one of which gives the typical wiring of Cutler-Hammer electric gear shift and the other shows the essential elements of the wiring as applied to a Pullman car.

The exact wiring of this Pullman 4 cylinder car using both the A25 Appleco starting system and gearshift is not available so we have made up one which includes both features. In the illustration which gives the wiring of the gearshift only, it will be seen that a two wire system is employed. However, as you have the wiring mixed up, it might be better to follow the other illustration and make it essentially a grounded system.

To do this one terminal of each of the solenoid coils in the gearshift may be grounded. The other terminals then connect to the outer terminals of the controller on the steering wheel. The center terminal of the controller then connects to the master switch and the master switch connects to the "A" plus terminal as shown on the diagram.

At the upper portion of this diagram a wire is shown going to the lights and this should first be connected to the

lighting switches and then from the other side of the switches a wire should go to the various lights.



Wiring diagram for Cutler-Hammer gearshift

FOREIGN CARS WHICH USE SLEEVE VALVES AND FOUR WHEEL BRAKES

Q—List the names of all foreign and domestic makes of automobiles that use the Knight type sleeve valve engine.—Midland Garage, Lawton, Okla.

The following named cars use the sleeve valve engine, Daimler, British; Vulcan, British; Gobron, French; Mors, French; Panhard, French; Peugeot, French; Voisin, French; Daimler Mercedes, German; Minerva, Belgian; Brewster, Handley, R & V, Stearns, Willys and Sterling, American. The Gobron, Mors and the Itala use a sleeve valve but it is not of Knight type, it being in each case a special invention and development of the companies mentioned. The other cars named use the Knight engine.

Q—Send us a list of foreign makes of cars using four-wheel brakes, listing separately the ones using a hydraulic and mechanical band type.

The following is a list of French cars using four-wheel brakes—those indicated with a star are cars on which four-wheel brakes are optional: Alba*, Aries*, Ballot, Bellanger, Bignan, Bugatti, Chenard Walcker, Delage, Delahaye, Farman, Fonck, Gobron, Hotchkiss, Irat, LaBurre, Mors*, Panhard Levassor*, Paulet, Rochet Schneider*, Rolland Pilian, Slim, Talbot Darracq, Voisin, Fox*, Delaugere Clayette, Delaunay Belleville, Des-Moulins*, Bavelaire, Berliet, Bolee, Brasier, Buc, Pugeot*, Buchet*, Corre la-Licorne*, Cottin Desgouttes, De Dion Bouton, Hispano-Suiza, Hurto, Lorraine-Dietrich*, Mathis, Motobloc*, Omega*, Perle*, LaPonette*, Rally, Renault, Georges Roy, Siga, Sizarre Berwick*, Suere, Turcat Mery, Unic, Vermorel*, Zedel*.

Belgian cars using four-wheel brakes are the a'Aoust, Dunamis, Miesse, Sava, Excelsior, Abadal, Metallurgique, Nagant

Italian cars using four-wheel brakes are the Ansaldi, Chiribiri, Lancia, Nazzaro, Fiat, Spa, Itala, Isotta Fraschini and the O. M.

Other foreign cars using four-wheel brakes are the Austin, British; Elizalde, Spanish; Mayback, German.

To the best of our knowledge, from information gained from statistics compiled by the Automotive Industries organization, all of the cars listed have mechanically operated brakes with the exception of the Rolland Pilian and the Bugatti.

THIS RADIATOR DOES NOT LEAK

Q—How often is it advisable to change the water in the radiator of a touring car?—C. C. Morey, Napolion, Ohio.

The only reason for changing water in a cooling system would be to flush out sediment or rust. The frequency with which this should be done is a matter of personal opinion, but we would suggest that spring and fall would be suitable time at which to do this.

Easiest Method of Installing Big Inlets on Buick Engine

Q—I would like to know what you have to say in regard to the practicability of reaming the cage ways and fitting the valves directly into the head on a C25 Buick. I figure if such a thing is possible that it will increase the speed and power considerably. The cylinders have been reborod .031 oversize and fitted with DeLuxe pistons. Can you tell us the approximate speed of the machine after being fitted with the special valves? The idea is to have a fairly fast machine for ordinary driving. The remainder of the machine has been brought up to the point where we believe it is worth while to put quite an expense on the engine to make it better.—R. A. Eby, Spring Valley, Minn.

It is impossible to ream the cage ways and still have a valve because the valve cage is necessary to act as a valve guide for the stem of the valve proper. The easiest and perhaps best method of installing a larger valve in this engine would be to retain the original valve cages and have the valves seat in the cylinder head. This is illustrated at Fig. 64. To do this it will be necessary of course to shorten the cage slightly at its lower end and to ream the port in the cage which admits the mixture.

We would advise making this change only on inlet valves as the results gained by enlarging the exhaust will not compensate for the extra work and will also limit the size of the inlet valves that can be installed. In addition to the larger valves we would advise a general overhauling of the engine with special attention paid to balancing and bearing fitting. In regard to the De Luxe pistons we would advise that you fit them a little looser than ordinarily done with cast iron pistons because of the fact that the walls are so thin that they tend to expand considerably more than the conventional iron piston.

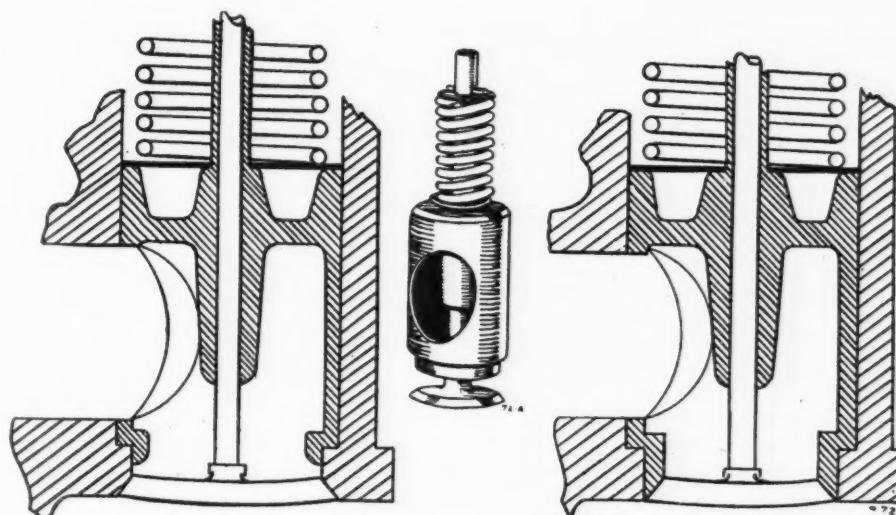
FUNDAMENTALS OF ELECTRICAL TESTING

Q—Let me know the best method of testing the wiring on automobiles; how is it done and what instruments are used?

1—Defects in wiring are of two kinds, either open circuits or short circuits, which on cars today are usually grounds, due to the frame or other metal portions of the car rubbing through the insulation and touching the wire.

It is usual to make a test of the wiring only when some trouble develops. For example, if one head light does not light up and the other one does, it shows that there is an open circuit at some point.

With one side of the battery grounded and a test lamp or voltmeter connected from the frame of the car to the other battery terminal, an indication will be obtained either by the lamp lighting up or by the voltmeter registering the battery voltage. From the live battery terminal a connection is supposed to go through the car wiring up to the lamp in question. The best way to trace this out, of course, is to use a wiring diagram of the car. With such a diagram at-



tional tests may then be made along this circuit which goes to the lamp.

The symptoms noticed, of course, indicate the amount of testing necessary. If one headlamp lights up and the other does not, it shows that the circuits are O. K. up to the point where the wires branch off, one going to each lamp. Accordingly, a test can be made where the wiring attaches to the headlamp plug and if the circuit is alive at this point, then the trouble is probably in the lamp, either in the wire connections back of the reflector, in the socket, or in the bulb itself.

If the trouble should be general, and all lamps would be out, it might be well to start testing at the battery, taking voltage or getting a test lamp to light and working along the circuits until a point was obtained where no indication or voltage reading could be secured. This would indicate the location of the open. For example, a voltmeter reading or lamp test might be obtained on one side of the lighting switch, whereas the other side of the switch would be dead. This would, of course, show trouble in the switch.

The other trouble that may take place in wiring is due to short circuits. In some cases this may blow a fuse, if fuses are used on the car. To test for a condition of this kind, it is sometimes considered helpful to disconnect the main battery cable right at the battery terminal and connect between it and the battery terminal either a test lamp or voltmeter. Then, if there is a ground on the line, the lamp will light or the voltmeter will register.

Then it is possible to start disconnecting the wiring at various points until a wire is removed which puts out the test lamp or causes the voltmeter to cease registering. That means that the short or ground is in that particular wire which has been disconnected. Then it is a case of examining the wire carefully to see where it is being cut by the frame of the car or otherwise grounded.

What Makes the Contacts Burn

2—What makes the interrupter contacts pit up on a car every 100 miles?—Chair. Buckfield, North Branch, N. Y.

2—Poor material in the contacts, a low capacity or poorly connected condenser, the wrong coil which allows too much current to flow or too high a voltage due to a poor connection between the generator and battery may cause interrupter contact points to burn.

CLEANLINESS IS NEXT TO ADHESIVENESS

Q—Advise how I can make babbitt stick to a connecting rod big end. I am rebabbing rods and have trouble making the babbitt stick to the rods, especially where they have burnt out and the end of the rod has worn smooth before it was removed from the car.—A. D. Freeman, Binger, Okla.

Perhaps you are not tinning the surface of the rod before pouring the babbitt. This process is similar to soldering and first of all requires that the end of the rod be perfectly clean. No grease or dirt should be on the surface or the solder will not stick to the rod. After the surface of the connecting rod has been thoroughly cleaned, the rod should be heated up by means of a blow torch or by any other convenient method and by means of cut soldering acid and solder the surface should be thoroughly tinned. It is then considered desirable to keep the rod fairly hot while the babbitt is poured.

Another possibility is that the metal when poured is not the proper temperature. This should be between 800 and 840 degs. Fahr. If no pyrometer is available this temperature may be estimated by the appearance of the metal. At about 900 degs. the pot and metal turn red and the metal burns; coating rapidly when the scum is scraped off. This temperature is too high. When at the proper temperature the metal appears like quicksilver and tarnishes slowly when the scum is scraped off, the coat of tarnish showing all colors. When too cold the metal acts sluggish and the tarnish takes on a dull appearance. Some mechanics check the temperature with a piece of soft dry pine. This stick should char immediately, but will not catch fire unless held in the metal for some time.

Oiling and Axle of 1917 Jeffery

Q—Explain oiling system of engine in 1917 Jeffery, model 472.

1—Diagram of the lubrication system of the 1917 Jeffery is given. The engine is lubricated by a combined splash and gravity system. The crankcase should be filled with oil until the ball is one-half way between the high and low marks on the gauge. The lower ends of the connecting rods dip into the oil and splash it over all the moving parts of the interior.

The oil pump is located in the crankcase near the front at the right side and is driven by the camshaft. In the illustration this shows in the lower left-hand corner. Part No. 51A623 is the eccentric strap operated from the camshaft and imparting up and down motion to the pump plunger. Vibration of the hand on the oil pressure gauge, located on the instrument board, indicates that the oil pump is in good working order and that the motor is being properly lubricated.

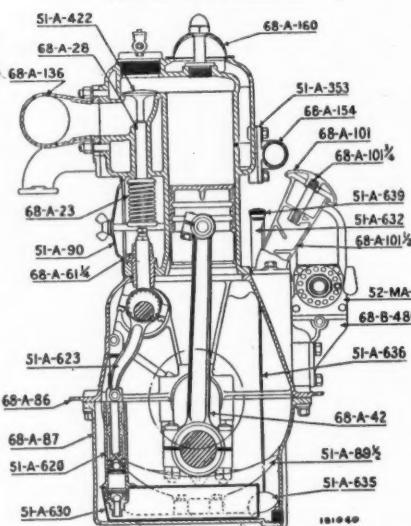
2—Give diagram and show adjustment of the rear axle of 1917 Jeffery.—Poelker's Garage, New Baden, Ill.

2—The first adjustment that should be tried is shifting the drive pinion, which is part No. 68 H 16, backward or forward, as the particular case requires. To make this adjustment it will be necessary to remove the pinion shaft bearing nut lock, 68 H 147, located just back of the universal joint on top of the differential housing. The best results are usually obtained when the heel of the drive pinion is in line with the heel of the bevel drive gear. It may be necessary to move the adjusting nut, 68 H 117, one or two notches, which ever way gives the best results.

In changing the position of the pinion shaft and gear, it will be necessary to tighten or loosen lock nuts at the front end of pinion shaft. If the pinion be set closer to the bevel gear, the nuts should be loosened first and, if set away, the nuts should be tightened to take up the end play.

The bearing adjusting nut is accessible through the opening made by removing lock 68 H 147. The heel of the gears can be seen by removing a large plug in

Motor Lubrication



front end on the left side of the differential housing. If it is necessary to adjust the bevel drive gear, 68 H 18, remove the differential carrier cover 68 H 23. The best result will be obtained when the pinion and gear are set close, allowing no back-lash. To adjust the bevel gear, loosen the bearing adjusting nut, 68 H 134, on one side, and tighten the one opposite an equal number of turns.

TO BUILD OR NOT TO BUILD—

A GROWLER

Q—Advise how I can make a transformer to test small armatures that will work on 110 volts D. C. Describe circuit breaker or any other means for interrupting the current to work in conjunction with transformer. I remember reading the above-mentioned information in some issue of Motor Age just last spring. How will an old model G. F. Auto-Lite frame work with the inner frame removed and the pole end cut away to allow an armature to be placed in the frame? How can I wind the magnetizing coil?—Fred F. Stodgel, Alexandria, Va.

What you refer to is ordinarily called a growler rather than a transformer, although it does operate on the transformer principle when the armature is in place, the winding of the armature taking the

place of the second winding of the transformer.

However, transformers and growlers do not work on direct current, but only on alternating current. With a suitable vibrator, however, a growler may sometimes be used on direct current, but there is no reason for using 110 volts as a 6 or 12-volt battery is sufficient. On 110-volts the current would be too strong and would doubtless burn out the growler and the vibrator.

The article to which you refer was published in the April 12 issue of Motor Age and we are sending you this sheet.

We have occasionally seen growlers made from old auto-lite generators and have been advised that they are satisfactory, but we have no data as to the winding. Would also call your attention to the fact that if you figure the cost of your time and cost of material that it is often cheaper to buy a device of this sort than it is to make one. We would accordingly suggest your looking through the ads in Motor Age, where devices of this sort are frequently described.

AN ALLEN CAR THAT DID NOT GO INTO PRODUCTION

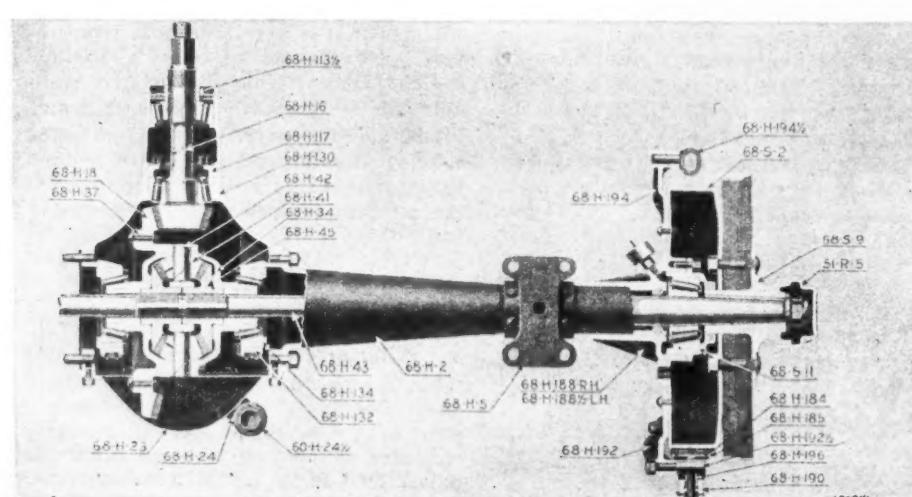
Q—Referring to the inquiry of Edwin J. Olds in the Readers' Clearing House of August 23rd, can say that Allen Company made a few motors in early part of 1918 with a bore of 3 1/2 in. and stroke between 5 and 5 1/2 in. Do not recall at present the exact length of the stroke.

This engine was practically perfected at that time and I understand was ready for production but was dropped on account of the war. It had 4 cylinders, 16 valves, counterbalanced crankshaft, the later ones had a full force feed oiling system, and it showed much promise when it was dropped. I saw one of them undergoing block test when at Fostoria after a car for a customer.

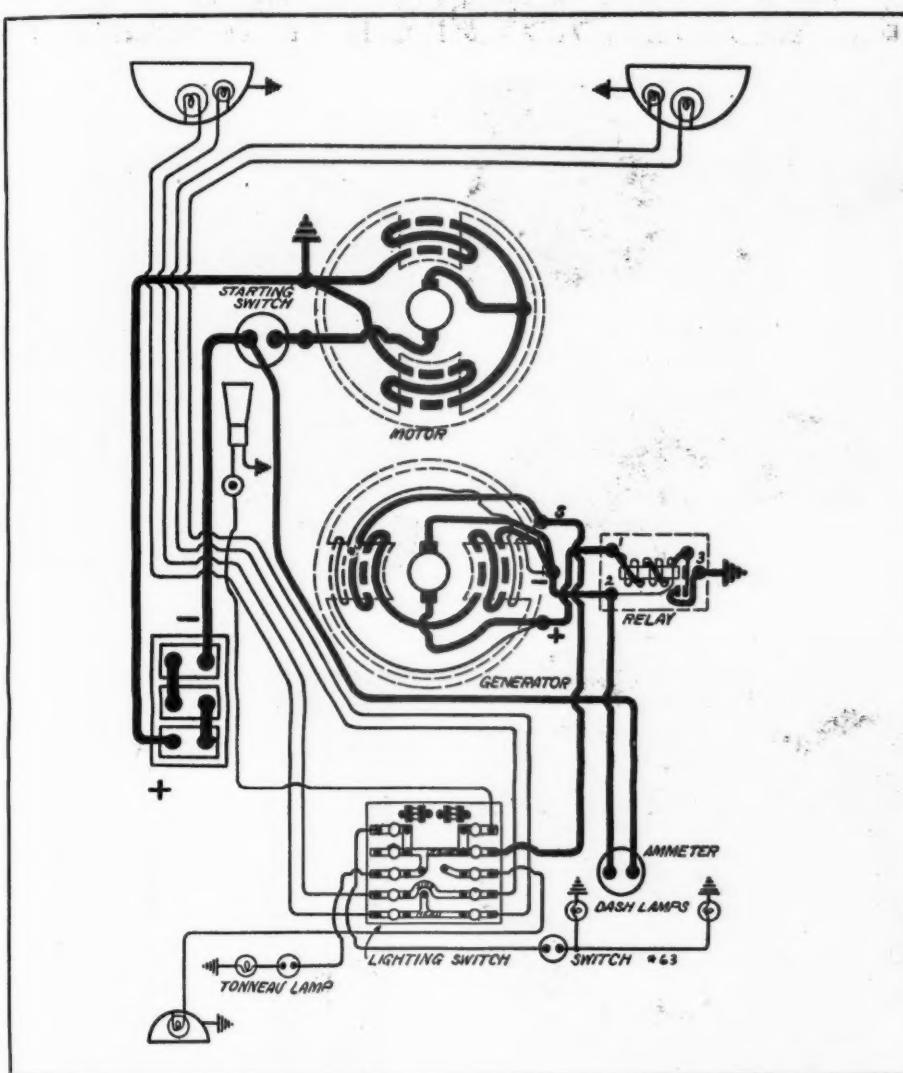
At that time this engine had a two-bearing crankshaft counterbalanced, and combination force feed and splash lubrication, which was found insufficient to take care of the engine at speeds developed, but at that was doing over 3600 r.p.m. and showing better than 75 hp. After changes were made in gas manifold, crankshaft, lubricating and some other points, I understand they produced as high as 90 to 100 hp. on the block.

Your correspondent may have got hold of one of these experimental cars as several were made up with this engine although they were not listed in all literature of that year. The engines were made at the L. A. Somer factory at Bucyrus, Ohio, a part of the Allen organization, where all of the Allen engines were made. I tried to get hold of one of these cars but was not able to get one at the time.—Mark Hay, Kewanee, Ill.

MOTOR AGE is grateful to this subscriber for information which we did not possess regarding the 3 1/2 inch Allen engine. For the benefit of those who possess Allen cars and have trouble securing parts we would advise that they communicate with the Allen Motor Car Company, 400 Dublin Ave., Columbus, Ohio. Although production has ceased on this car the original name is retained and there is a small organization engaged in manufacturing parts for the old models.



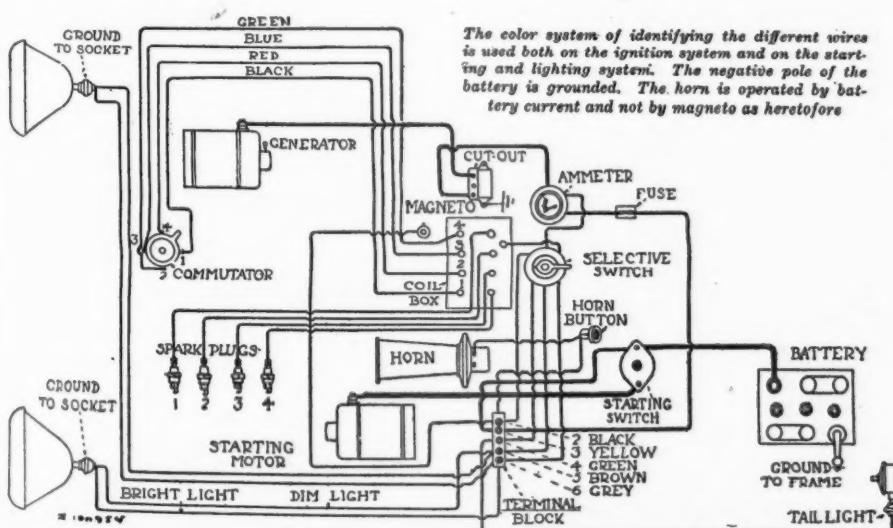
Electrical Systems for Ford



Q—Send me the wiring diagram of the Gray & Davis starting and lighting system as used on Ford cars of 1921.—A. L. Bennett, care Griswold's Camp, Three Lakes, Wis.

Wiring diagram of the Gray & Davis Ford installation is shown at Fig. 63. A 1921 Ford car is equipped with factory equipment as regards the starting and

lighting system and should be the system as shown in the illustration. The 1921 electrical systems were manufactured by the Ford Motor Co., but it is possible that a 1921 model was purchased without starter and a Gray & Davis outfit installed, we are, therefore, showing both wiring diagrams.



When the Spindle Bolt Wobbles

Q—Advise where a replacement hot-spot manifold for a Buick D-4 truck may be obtained?

1—This information will be given by letter.

2—On Dodge front axles where thread is stripped in lower portion of yoke it allows the spindle bolt and the spindle to wobble. The spindle bolts are $\frac{5}{8}$ -inch in diameter, while the threaded portion is 9/16-inch in diameter. The threads only extend about $\frac{3}{4}$ -inch through the lower side of yoke and soon wear out. The bolt forms a shoulder against the threads and extends about half way through lower side before threads start. Suggest way of repairing this condition. I was going to get $\frac{5}{8}$ bolts with $\frac{5}{8}$ threads and put $\frac{5}{8}$ -inch bushing in yoke with $\frac{5}{8}$ threads used.—S. W. Moebius, Frisco, Utah.

The recommended procedure is to remove all parts from the front axle I-beam and then swedge the lower portion of the yoke so that the hole is reduced in diameter. It will be necessary to heat this portion of the yoke in a forge and make a regular blacksmithing job of it. The heating should not be allowed to extend any farther into the axle than is absolutely necessary to reduce the size of the hole, for it is practically impossible to re-heat treat the axle as would be done at the factory. This being the case it is well to allow the axle to cool without quenching it, for quenching may cause this portion to become brittle.

After the hole has been sufficiently reduced in size and the axle has cooled it can be retapped to take a standard bolt. Care should be taken that only the standard bolt for this purpose is used, for it is essential that this bolt be hardened to withstand the wear of the turning action which takes place upon it.

The method you suggest is substantially o. k. if it leaves enough stock in the boss after it has been bored out for the bushing. However, to get the advantage of this construction, you should make it impossible for the bushing to turn. One possibility would be to thread it in place and put it in with sulphuric acid so that it will corrode and stick solidly.

STICK TO 12 VOLTS OR WIND IT BY HAND

Q—We have a 1915 Dort model 4 car, which has a motor generator made by the Apple Electric Co. Is it possible to wire this car to use a common 6-volt battery and still use the starter and generator? If this is possible, please send a wiring diagram.—Elmer Widrig, Benton, Mich.

It is not possible to use a 6 volt battery on this car and still use the machine as a starter. However, if you ever come to the point where you would be satisfied to always crank the engine by hand, then it would be possible to wire it for 6 volt operation only. To use the starter however, you must continue to use a 12 volt battery which is essentially two 6 volt batteries built up in the same box.

This is due to the fact that the ordinary motor generator is not very efficient as a starter at six volts and needs twelve to get the necessary torque.

BOOSTING ACCESSORY SALES

HOW many open cars are there in your territory? How many of them will be used by their owners all winter? The answers to these questions depend perhaps, upon you. Certainly the answer to the latter question is up to you. If the owners of open cars are to keep running this winter you will have the responsibility of selling them on the use of their car.

Perhaps one letter will "turn the trick." The letter we have in mind would be one that would lay down briefly, just what is necessary for the motorist to do to his car in order to keep it running good. It would discuss lubrication, the need of heavier oil and the need of changing that oil often. It would tell of alcohol or other anti-freeze solutions in the radiator and give the owner the information exactly as he will need it.

The letter would not be an attempt to sell any one or any group of accessories—it would be to sell winter driving. Winter tops, radiator fixtures, heaters, robes and all of the accessories for winter driving would be left until the time when the owner called for lubrication service or alcohol. Then, when he is sold on running his car in the winter, sell him the accessories.

If he does not drive in for more complete winter driving information, go and call on him and find out what he intends to do—it will mean money to you in the winter. The first thing to do, however, is to sell winter driving and now is the time to do that, both by letter, newspaper advertisement and personal call.

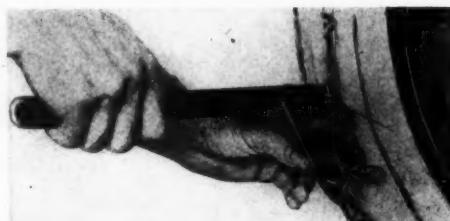
There are many things for which there will be an unusually heavy demand, if you keep after the car owner to continue the use of his car in the cold weather. However, do not try to do anything just yet, but sell winter driving. Call attention to winter sports, a day in the woods and the dependability of the car for all cold weather driving.

The open car owner will need your special attention and it would be a good idea, were you or some member of your organization to call on each owner and give them instructions on just what to do to keep the car working efficiently.

The Geiger Mfg. Co., Atchison, Kas., announces the Geiger Chain Tool, designed to tighten and connect anti-skid chains on tires. With this tool, it is possible to put chains on tight, thereby aiding in the prevention of skidding and slipping.

The Mulkey Spark Plug Co., Fourth and Kansas avenues, Atchison, Kas., has brought out the Mulkey Spark Plug. The illustration shows the construction of the Mulkey plug and the special feature of it is the ball which jumps each time the engine fires. The plug is also self cleaning.

The Asco Non-Corrosive Terminal is the product of the Hiawatha Sales Co., Atchison, Kas. Some of the things claimed for this terminal by the manu-



Geiger chain tool



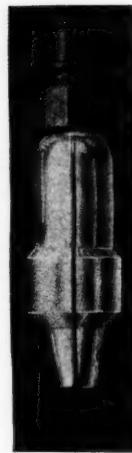
Asco battery post



Liberty radiator front



Duff-Dry battery



Beacon-Lite spark plug



Mulkey spark plug

facturers are that it will not stick to the battery post, the metal is elastic and will not break when opening or clamping to the post. The raised cable arm is said to keep the acid away from the cable. It is made for any size cable and sells at \$1.

The Beacon-Lite Spark Plug is made by the Beacon Spark Plug Corp., North Tonawanda, N. Y., and sells at \$1.25 each. The cut shows the core of the plug which is made of opalite, a non-porous, heat resisting transparent substance that will stand severe abuse.

The Rex Handy Dimmer for all makes of cars is the newest addition to the Rex line of the Ajax Auto Parts Co., Racine, Wis. This dimmer is designed to aid the driver at night. It brings the headlight control to his finger tips and a slight touch instantly gives him bright or soft lights. The list price of the Rex dimmer is \$1.50.

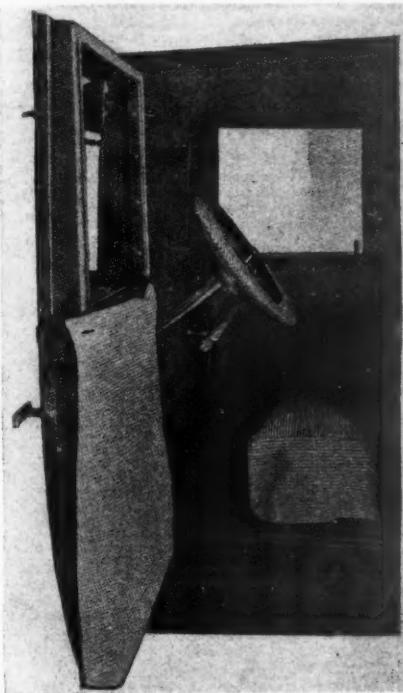
The Duff-Dry Battery is manufactured by the Hammon Mfg. Co., 744 Lamphere street, Dunkirk, N. Y. Some of the claims made for this battery by the Hammon company are: Gives more power; re-

quires no attention; requires no water; fires intense spark; cannot freeze; is not injured by overcharge; has no post corrosion, no injurious sulphation, and no rotted boxes.

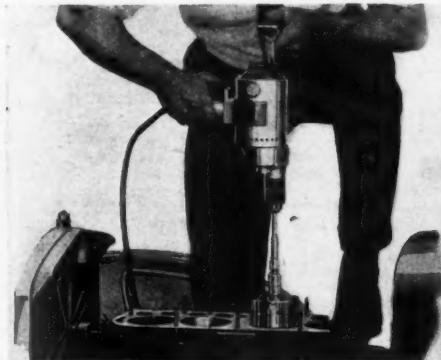
The Liberty All Metal Radiator Front is designed to prevent freezing and is made by the Liberty Engineering Corp., 30 Church street, New York. The cut appearing on this page, shows the radiator front open. From this point, it can be adjusted to any point desired, to maintain perfect regulation in any weather. This adjustment is controlled by a dash fixture. For Ford cars, it sells at \$6; Chevrolet, Oakland and Star, \$8 and at \$10 and up for all other makes of cars.

The Biflex Corp., Waukegan, Ill., announces that the Biflex Cub Bumper for Fords is now in production. This addition to the Biflex line is built along the same general lines as the bigger ones of the same name and is just as strong and durable as the larger ones. The Cub model sells at \$18 for black enamel and \$19 for nickel.

GETTING MORE OUT of the SHOP



Kleenkar covers



Ammco centrimatic hone



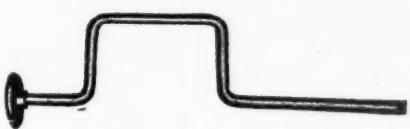
Sta-Set adjustable wrench



Keyco adjustable wrench



Forsberg hacksaw frame



Dot socket and speed wrench

IN your winter service letter, you can well afford to bring in the shop equipment—how you are prepared to do work quickly and at small cost. Selling the car owner on winter driving is not by any means a difficult job. He wants to drive his car in the winter but he wants the assurance from you that you can take care of his every want and prepare his car for and keep it in trim to drive in the cold weather.

He wants a few important accessories and perhaps some new tires and tubes but most of all, he wants to know that he can take his car to you, in the event of trouble and have it returned to him quickly and satisfactorily and at a reasonable charge.

C. C. Van Tine, Bartlesville, Okla., has placed on the market an oil bottle tray, which is an oil tight pan of heavy tin plate. The bottom of this tray is corrugated so as to protect the bottles from sudden contact with cement floors. The top band and bail are of one-eighth by one-half band iron. The bail is detach-

able for convenience in shipping. It is red enamelled. The standard size tray, with room for six bottles, is priced at \$1. The eight bottle size is \$1.35.

The United States Air Compressor Co., 952 E. 72nd street, Cleveland, Ohio, has added a new heavy duty Usaco compressor to their line. It is claimed that this new type, LB, is a complete unit of approved construction capable of handling continuous heavy service with a minimum of attention.

According to the manufacturers, the LB is compact and sturdy in design and quiet in operation. It is specially adapted for operating gas pumps, pneumatic tools and lifts, air operated doors, etc.

This compressor is available in either two stage or single stage and in fully automatic units or simple compressors. Both the fully automatic and simple types have displacements of from 8 to 20 cu. ft. per minute.

The Ammco Centrimatic Hone operates by centrifugal force and the stone mount-

ing is designed to provide a backing for the stones over their entire length. Each stone is held by a steel channel and hollow set screws, thereby distributing the pressure when honing over the entire length of the stone.

No adjustments are required to fit the hone to cylinders from 2 13/16 to 5 in. in diameter. The centrifugal action due to the rotation of the hone extends the hone to the correct diameter and also provides the proper cutting pressure.

There are no springs or internal adjustments. The hone is operated at a speed of from 800 to 1100 r.p.m. by portable electric drill, standard drill press, or honing machine. Automotive Maintenance Machinery Co., 549 W. Washington street, Chicago.

Much has been said lately about greasy cars coming from the repair shop and going into the hands of owners with splotches of oil and grease on the seats, running boards and steering wheel. Kleenkar Covers, to be put over the car, both inside and out, while the mechanic is working on that car, have been brought out by the Automotive Fabric Equipment Co., 703 Cass street, Milwaukee, Wis. Kleenkar covers are fitted over every part of the car exposed while work is being done on it and they insure the car being delivered to its owner, free from grease and oil spots.

The Keystone Tool and Metal Parts Corp., 65 Oak street, Buffalo, N. Y., is the maker of the Dot Socket and Speed Wrenches which are made in several sets and sizes. The eight socket set in metal box with ratchet stub and L handle is priced at \$1.50. The six socket set with L handle in cloth bag is \$.90 and the five socket set with L handle in cloth bag at \$.75. The 32 in. speed wrench sells at \$1 and the 24 in. wrench at \$.75.

The Forsberg Mfg. Co., Bridgeport, Conn., has placed on the market, the Forsberg Hack Saw Frames which are adjustable to any degree between eight and 12 inches. They are nickel plated and polished, and are fitted with an ebonized wood pistol grip handle. The blades may be faced in four directions. The frame, without blades, sells at \$12.

The Sta-Set Adjustable Wrench is made in four sizes, all in polished finish and packed one in a box, by the Hjorth Tool Corp., Jamestown, N. Y. The feature of these wrenches is the thumb-nut which does not rotate or slip and holds its adjustment until re-adjusted by the operator. The sizes made are six, eight, ten and twelve inches, and sell at \$.65 to \$1.50.

Keyco adjustable pipe wrenches are the product of the Keystone Mfg. Co., Buffalo, N. Y. The model No. 93 is shown on this page and comes packed in cartons of a dozen to sell at \$.6. The capacity of this wrench is from 0 to 1 1/4 inches. The wrench is made from alloy steel and is heat treated.

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Atlanta	Southern Automobile Show	Feb. 16-24
Atlanta	Tractor and Power Equipment Show	Oct. 6-13
Baltimore	Annual Automobile Show	Jan. 19-26
Bethlehem, Pa.	Closed Car Show at the Coliseum	Oct. 1-4
Brooklyn, N. Y.	Annual Automobile Show	Jan. 19-26
Chicago	National Automobile Show	Jan. 26-Feb. 2
Chicago	Good Roads Show	Jan. 14-31
Chicago	Chicago Closed Car Show, Coliseum	Oct. 13-20
Chicago	Annual Salon, Drake Hotel	Jan. 26-Feb. 2
Columbus, Ga.	Automobile Show	Oct. 15-20
Dallas, Texas	Annual Fall Show	Oct. 13-23
Dallas, Texas	Annual Automobile Show	Feb. 11-17
Danbury, Conn.	Automobile Show in Conjunction with	
Des Moines	Annual Automobile Show	Feb. 25-March 1
Detroit	Annual Closed Car Show	Oct. 6-13
Fresno, Calif.	State Fair	Oct. 1-6
Holyoke, Mass.	Annual Closed Car Show	Oct. 11-13
Little Rock, Ark.	Automobile Show	Sept. 28-Oct. 5
Louisville, Ky.	Annual Automobile Show	Oct. 8-13
Louisville, Ky.	Automobile Show at the Jefferson County Armory	Feb. 18-23
New York	Annual Closed Car Show	Oct. 1-6
New York	Annual Electrical and Industrial Exposition	Oct. 17-27
New York	Foreign Automotive Association Exposition	Nov. 4-10
New York	Annual Salon, Hotel Commodore	Nov. 11-17
New York	National Automobile Show	Jan. 5-12
Peoria, Ill.	Implement and Vehicle Show	Sept. 26-Oct. 6
Salt Lake City	Fall Show in Conjunction with State Fair	Oct. 1-6

Toledo	Annual Closed Car Show	Oct. 13-17
Waco, Texas	Annual Automobile Show	Oct. 20-27
Washington, D. C.	Annual Fall Closed Car and Accessory Show	Oct. 28-Nov. 5
Washington, D. C.	Annual Fall Automobile Show	Oct. 28-31

FOREIGN SHOWS

Buenos Aires	Annual Automobile Exposition	Nov. 1-15
London	Motor Car Exposition	Nov. 2-10
Montreal	Closed Car Show	Sept. 29-Oct. 6
Paris	Automobile Show at Grand Palais	Oct. 4-10
Paris	Truck and Tractor Show at Grand Palais	Oct. 24-Nov. 2

RACES

Allentown, Pa.		Oct. 13
Berkeley, Calif.	Thanksgiving	
Danbury, Conn.		Oct. 6
Danbury, Conn.		Oct. 20
Hartford, Conn.		Oct. 27
Kansas City Speedway, Auspices of the A. A. A.		Oct. 17
Los Angeles		Nov. 29
Oakland, Calif.		Nov. 1

CONVENTIONS

Chicago	Exhibit and Convention of Automotive Equipment Association	Nov. 12-17
Cleveland, O.	Society of Automotive Engineers Production Meeting	October
Cleveland, O.	Thirtieth Annual Convention, National Assn. of Farm Equipment Manufacturers	Oct. 24-26
Columbus, O.	Annual Convention, Ohio Trade Assn.	Dec. 5-6
Detroit	S. A. E. Annual Meeting	Jan. 22-25
New York	National Tire Dealers' Assn. Convention	Nov. 13-15

SQUEEKS & RATTLES

Sunstroke or What?

Believe it or not tis true said he
 I filled my tank with a Woodruff key
 I mended a wheel with an old tire patch
 I fixed a tire with an old burnt match
 I cleaned my pipe with a new spot light
 I saw a sign in the dead of night
 I soundly slept as I drove top speed
 I was chased by a cop through the oil sight feed
 No oil would feed on the khaki top
 The sun beat down and I wanted to drop
 The job I was on I could hardly stand
 And still be lying you understand
 So don't judge harshly the tale is true
 If studied thoroughly through and through
 If read as really it ought to
 Tis a study in punctuation you see.

—HAP.

Help, help!

Drive On, Macbeth

A motorist driving, with his wife, over an unfamiliar road in Illinois, late at night, turned his spotlight on a sign which read, "Detour, 3 Miles." Following the road indicated, he had gone some distance when his wife remarked, "I believe we are on the wrong road."

"Why?" he asked.

"Well, we have traveled more than three miles and there is no evidence of the town of Detour, yet."

O. Y. Marry.

Help, Kay Em, Help!

Help, everybody, help!

Help, Help!

Again, we feel the pressure of the shows and other things weighing down upon our oft' confessed feeble efforts. And again we come to you with a frenzied plea for aid. For, has it not been said that we shall do the pass out stunt if everyone is not heard from?

It's up to you—Help! Help! HELP!

Help, everybody, help!

Still Going Strong

"How long did it take your wife to learn to drive?"
 "It will be ten years in September."—The Passing Show (London).

Help, anybody, help!

Sketches From Life



Willie

Willie wrote us last week that he was going to come to our rescue and take Squeeks & Rattles out of the ordinary class with some of his sparkling wit. He slipped first thing so the best we have to offer this week from Willie is Willie himself. Maybe by next week, he'll have thought up some sweet gem.

Help, help!

BY GEORGE: You've got us all wrong, buddy—that wasn't the idea at all. But don't you agree with us that a fellow who boasts of being in business ought to at least have letterheads printed so that when he writes for information which is given only to dealers, there will be no question? With you, it's different—but as for the farmer stuff, it might have been college professor too, because the information that Princeton Subscriber wanted was stuff that only a dealer would be interested in and since he didn't have a letterhead, wouldn't it be natural to assume that he was anything but an automotive dealer? You're one of the gang so let's hear often from you.

HELP, Help, Help!

LEW BRICATION.

Current Motor Truck Specifications

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE			REAR AXLE	TIRES	MAKE AND MODEL	Tons Capacity	ENGINE			REAR AXLE	TIRES							
			Make & Model	Bore & Stroke	Clutch Make					Make & Model	Bore & Stroke	Clutch Make									
Acme.....20	3/4-1		Co-N.....	3/4x5	B&B.....	Cot.....	Ti-6250.....	WO.....	34x5n	34x5n	Double Dr. DFT	3	\$4000	Bu-ETU.....	4 1/4x5 1/2	B&B.....	Own.....	WO.....	36x6		
Acme.....30	1-1 1/2		Co-N.....	3 1/2x5	B&B.....	Cot.....	Ti-6352.....	WO.....	34x3 1/2	34x5	Duplex.....	G		Bu-WTU.....	3 3/4x5 1/2	B-L.....	Own.....	SB.....	33x5n		
Acme.....40	1 1/2-2		Co-J4.....	3 1/4x5	B&B.....	Cot.....	Ti-6160.....	WO.....	31x3 1/2	34x5	Duplex.....	GH	1/2	Bu-WTU.....	3 3/4x5 1/2	Cov.....	Sh-1501.....	WO.....	35x5		
Acme.....60	2 1/2-3		Co-K4.....	4 1/2x5 1/4	B&B.....	Cot.....	Ti-6560.....	WO.....	36x4	36x7	Duplex.....	A	2	2775	Hi-400.....	4x5 1/2	Cov.....	Sh-103.....	WO.....	35x5n	
Acme.....90	3 1/2-4		Co-L4.....	4 1/2x5 1/2	B&B.....	Cot.....	Ti-6660.....	WO.....	36x5	40x10	Duplex.....	AC	2 1/2-3	Hi-400.....	4x5 1/2	B-L.....	Vu-4.....	WO.....	34x5		
Acme.....125	5 1/2-6		Co-B3.....	4 1/4x6	B&B.....	Cot.....	Ti-6700.....	WO.....	36x6	40x12	Duplex.....	E	3 1/2	3500	Bu.....	4 1/4x5 1/2	B-L.....	Own.....	IG.....	36x8	
Amer. La France	3 1/2	\$1950	Own.....	4 1/4x6	Own.....	Own.....	Own.....	WO.....	36x5	36x5	Eagle.....	101	1-1 1/2	1875	Bu-MU.....	3 3/4x5 1/2	Cov.....	Cov.....	To-S406.....	IG.....	3 1/2x5n
Amer. La France	3	5500	Own.....	4 1/4x6	Own.....	Own.....	Own.....	WO.....	36x6	40x6	Eagle.....	100	2	2275	Bu-CTU.....	3 3/4x5 1/2	Cov.....	Cov.....	Ru-6000.....	IG.....	3 1/2x7n
Armeled.....21	1 1/2		Bu-GTU.....	3 1/4x5 1/4	Ful.....	Ful.....	Ti-6160.....	WO.....	31x3 1/2	36x4	F. W. D.	B	3	4200	Wi-ETU.....	4 1/4x5 1/2	H-S.	Cot.....	SP.....	36x6	
Armeled.....HWB	21		Bu-HTU.....	4 1/4x5 1/4	B-L.....	B-L.....	Ti-6560.....	WO.....	36x4	36x4	Fageol.....	1 1/2		3000	Bu-CT.....	3 3/4x5 1/2	B-L.....	Own.....	SB.....	34x6	
Armeled.....HWC	21		Co-C4.....	4 1/4x5 1/4	B-L.....	B-L.....	Ti-6560.....	WO.....	36x4	36x4	Fageol.....	2 1/2		3900	Bu-CU.....	4 1/4x5 1/2	B-L.....	Own.....	SB.....	36x7	
Armeled.....KWC	3 1/2		Co-E4.....	4 1/2x5 1/2	B-L.....	B-L.....	Ti-6660.....	WO.....	36x5	36x5	Fageol.....	4		5000	Bu-DU.....	4 1/2x6 1/2	B-L.....	Own.....	SB.....	36x5	
Atlas.....25	1/2	1495	Bu-WTU.....	3 1/4x5 1/2	B&B.....	B-L.....	Ti-6700.....	WO.....	36x6	36x6	Fageol.....	6		5700	Bu-DU.....	4 1/2x6 1/2	B-L.....	Own.....	SB.....	40x6d	
Atlas.....40	1 1/2	2175	Co-K4.....	3 1/4x5	Ful.....	Ful.....	Ti-6160.....	WO.....	34x4	31x4	Federal.....	R	1		Co-J4.....	3 1/4x5	B&B.....	Det.....	Ti-6250.....	WO.....	33x5n
Atterbury.....20R	1 1/2-2		Co-K4.....	3 1/4x5 1/4	B-L.....	B-L.....	Ti-6560.....	WO.....	36x4	36x4	Federal.....	S2-22	1 1/2		Co-K4.....	3 1/4x5	B&B.....	Det.....	Ti-6560.....	WO.....	34x6
Atterbury.....22C	2 1/2-3		3375b	Co-K4.....	B-L.....	B-L.....	Ti-6660.....	WO.....	36x5	36x5	Federal.....	U2	2 1/2		Co-K4.....	4 1/4x5 1/2	B&B.....	War.....	Ti-6660.....	WO.....	36x5
Atterbury.....22D	3 1/2-4		1275b	Co-L4.....	4 1/2x5 1/2	B-L.....	Ti-6700.....	WO.....	36x6	40x7	Federal.....	W2	3 1/2-4		Co-L4.....	4 1/2x5 1/2	B&B.....	War.....	Ti-6700.....	WO.....	40x6d
Autocar.....21	1 1/2-2	2200	Own.....	4 1/4x4 1/2	Own.....	Own.....	DR.....	34x4	34x6	34x6	Federal.....	X2	3-6		Co-B5.....	4 1/4x6	B&B.....	War.....	30x3 1/2	32x1 1/2	
Autocar.....27	2-3	3100	Own.....	4 1/4x5 1/2	Own.....	Own.....	DR.....	34x5	36x8	36x8	Ford.....	TT	1	380	Own.....	3 1/4x4	Own.....	Own.....	WO.....	36x5	
Autocar.....28	2-6	4200	Own.....	4 1/4x5 1/2	Own.....	Own.....	DR.....	34x6	36x12	36x12	Ford.....	TT	1 1/2	2800	Bu-CTU.....	3 3/4x5 1/2	B&B.....	Own.....	WO.....	36x4	
Avery.....	1-1 1/2		Own.....	3 1/4x4	Own.....	Own.....	To-OX2.....	IG.....	34x5n	34x5n	Ford.....	Front									
Bessemer.....G	1	1450	Co-N.....	3 1/4x5	Ful.....	Ful.....	To-A.....	IG.....	35x5n	35x5n	G.M.C.	K16	1		Own.....	3 1/4x5 1/2	Own.....	Own.....	SB.....	34x5n	
Bessemer.....H	1 1/2	1995	Co-N.....	3 1/4x5	B&B.....	Bak.....	LM-7150	WO.....	36x3 1/2	36x3	G.M.C.	K1A1&B	2		Own.....	4 1/4x5	Own.....	Own.....	SB.....	36x4	
Bessemer.....J2	2 1/2	2395	Co-C2.....	3 1/4x5 1/4	B&B.....	B-L.....	LM-7250	DR.....	36x4	36x4	G.M.C.	K41	2		Own.....	4 1/4x5	Own.....	Own.....	SB.....	36x4	
Bessemer.....K4	3 1/2	3195	Co-E7.....	3 1/4x5 1/4	B&B.....	B-L.....	To-E.....	IG.....	36x5	36x10	G.M.C.	K7A1&B	3 1/2		Own.....	4 1/4x5	Own.....	Own.....	SB.....	36x5	
Bethlehem.....KN	1	1385	Own.....	3 1/4x5	B&B.....	Det.....	Ex-1000	SB.....	35x5n	35x5n	G.M.C.	K7T1	3 1/2		Own.....	4 1/4x5	Own.....	Own.....	SB.....	40x12	
Bethlehem.....GN	2	2185	Own.....	3 1/4x5 1/4	B&B.....	Det.....	Wi-600	DR.....	34x4	34x8	G.M.C.	K101A&B	5		Own.....	4 1/4x5	Own.....	Own.....	SB.....	40x14	
Bethlehem.....HN	3	2985	Own.....	3 1/4x5 1/4	B&B.....	Det.....	Wi-88E	DR.....	36x4	36x8	G.M.C.	K101B	5		Own.....	4 1/4x5	Own.....	Own.....	SB.....	34x5n	
Brockway.....E2	1		Wi-SU.....	3 1/4	B-L.....	B-L.....	Co-5200	SB.....	33x5n	33x5n	G.M.C.	K101C	5		Own.....	4 1/4x5	Own.....	Own.....	SB.....	34x5n	
Brockway.....S	1 1/2		Wi-SU.....	3 1/4	B-L.....	B-L.....	Ti-6160	WO.....	36x3	36x6	G.M.C.	K101D	5		1590	Bu-MU.....	3 3/4x5 1/2	B&B.....	Own.....	SB.....	34x5n
Brockway.....K2	2 1/2		Co-K4.....	4 1/4x5 1/4	B-L.....	B-L.....	Ti-6560	WO.....	36x4	36x8	G.M.C.	K101E	5		2375	Bu-WU.....	3 3/4x5 1/2	Garford.....	15		
Brockway.....R	3 1/2		Co-L4.....	4 1/2x5 1/2	B-L.....	B-L.....	Ti-6660	WO.....	36x5	36x5	G.M.C.	K101F	5		3250	Bu-HTU.....	4 1/4x5 1/2	Garford.....	70H		
Brockway.....T	5	45	Co-B5.....	4 1/4x6	B-L.....	B-L.....	Ti-6700	WO.....	36x6	40x7d	G.M.C.	K101G	5		4200	Bu-YU.....	4 1/4x6	Garford.....	77D		
Buick.....23-4-SD	2/4	945	Own.....	3 1/4x4 1/2	Own.....	SB.....	31x4n	31x4n	31x4n	31x4n	G.M.C.	K101H	5		5000	Bu-BU.....	5x6 1/2	Garford.....	68D		
Case.....TR	2		Own.....	4 1/4x5 1/4	TD.....	Own.....	To-C139	IG.....	36x6n	38x7n	G.M.C.	K101I	5		5750	Bu-BTU.....	5x6 1/2	Garford.....	150A		
Chevrolet.....Sup	1/2	395	Own.....	3 1/4x4	Own.....	SB.....	30x3 1/2	30x3 1/2	30x3 1/2	30x3 1/2	Harvey.....	WO	2		1775	Bu-CTU.....	3 3/4x5 1/2	Ful.....	F1		
Chevrolet.....U6	1	550	Own.....	3 1/4x4	Mun.....	SB.....	31x4n	31x4n	31x4n	31x4n	Harvey.....	WFB	2 1/2		250	Bu-ETU.....	4 1/4x5 1/2	Ful.....	F1		
Clinton.....(See Schwart)	2		Co-N.....	3 1/4x5	Ful.....	Ful.....	To-A.....	IG.....	35x5n	35x5n	Harvey.....	WFB	3 1/2		3950	Bu-YU.....	4 1/4x6	Ful.....	F1		
Clydesdale.....10	1 1/2		Co-N.....	3 1/4x5	B&B.....	B-L.....	Ti-5511	SE	34x5n	34x5n	Harvey.....	WFB	4 1/2		3950	Bu-YU.....	4 1/4x6	Ful.....	F1		
Clydesdale.....8	2 1/2		Co-K4.....	4 1/4x5 1/4	B-L.....	B-L.....	Ti-6160	WO.....	36x4	36x7	Harvey.....	WFB	5 1/2		3250	Bu-HTU.....	4 1/4x5 1/2	Garford.....	15		
Clydesdale.....6	3 1/2		Co-L4.....	4 1/2x5 1/2	B-L.....	B-L.....	Ti-6560	WO.....	36x5	36x5	Harvey.....	WFB	6 1/2		4200	Bu-YU.....	4 1/4x6	Garford.....	70H		
Clydesdale.....4	4 1/2		Co-B5.....	4 1/4x6	B-L.....	B-L.....	Ti-6660	WO.....	36x6	40x6d	Harvey.....	WFB	7 1/2		5000	Bu-BU.....	5x6 1/2	Garford.....	68D		
Clydesdale.....2 1/2	7		Co-B5.....	4 1/4x6	B-L.....	B-L.....	Ti-6700	WO.....	36x7	40x7d	Harvey.....	WFB	8 1/2		5750	Bu-BTU.....	5x6 1/2	Garford.....	150A		
Commerce.....9	3 1/2-1 1/4		Co-N.....	3 1/4x5	Dot.....	Dot.....	Sa-D16	SB.....	32x4 1/2	32x4 1/2	Harvey.....	WO	2		1265	Bu-ETU.....	3 1/4x4 1/2	Ful.....	F1		
Commerce.....14	1 1/2		Co-J4.....	3 1/4x5	B-L.....	B-L.....	Ti.....	WO.....	36x3	36x5	Harvey.....	WO	2 1/2		1265	Bu-ETU.....	3 1/4x4 1/2	Ful.....	F1		
Commerce.....25	2 1/2		Co-K4.....	4 1/4x5 1/4	B-L.....	B-L.....	Ti-6560	WO.....	36x4	36x7	Harvey.....	WO	3 1/2		1265	Bu-ETU.....	3 1/4x4 1/2	Ful.....	F1		
Corbitt.....S	2 1/2		HS-700	3 1/4x5	B-L.....	B-L.....	Sh-100	WO.....	31x4 1/2	31x4 1/2	Harvey.....	WFB	4 1/2		1265	Bu-ETU.....	3 1/4x4 1/2	Ful.....	F1		
Corbitt.....E1	1 1/2		Co-N.....	3 1/4x5	B-L.....	B-L.....	Sh-100	WO.....	34x3 1/2	34x4	Harvey.....	WFB	5 1/2		1265	Bu-ETU.....	3 1/4x4 1/2	Ful.....	F1		
Corbitt.....D	1 1/2		Co-J4.....	3 1/4x5	B-L.....	B-L.....	Sh-100	WO.....	34x4	34x5	Harvey.....	WFB	6 1/2		1265	Bu-ETU.....	3 1/4x4 1/2	Ful.....	F1		
Corbitt.....C2	2 1/2		Co-K4.....	4 1/4x5 1/4	B-L.....	B-L.....	Sh-103	WO.....	36x3	36x5	Harvey.....	WFB	7 1/2		1265	Bu-ETU.....	3 1/4x4 1/2	Ful.....	F1		
Corbitt.....B2	2 1/2		Co-K4.....	4 1/4x5 1/4	B-L.....	B-L.....	Sh-21	WO.....	36x4	36x8	Harvey.....	WFB	8 1/2		1265	Bu-ETU.....	3 1/4x4 1/2	Ful.....	F1		
Corbitt.....R3	3		Co-L4.....	4 1/4x5 1/2	B-L.....	B-L.....	Sh-21	WO.....	36x4	36x8	Harvey.....	WFB	9 1/2		1265	Bu-ETU.....	3 1/4x4 1/2	Ful.....	F1		
Corbitt.....A	3 1/2-4		Co-L4																		

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tens Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES		MAKE AND MODEL	Tens Capacity	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear			Price	Make & Model	Bore & Stroke	Final Drive	Front	Rear	Front	Rear
Larrabee	X2 1-1/4	Co-SR. t.	33/8x5 1/2	B-L.	B-L.	Sh-1480	SB.	34x5n	34x5n	Sandow	J 2 1/4	\$2750	Co-C4...	4 1/2x5 1/2	B-L.	Ti-6560	WO.	36x4	36x7	
Larrabee	J1 1-1/4	Co-J1.	33/8x5	B-L.	B-L.	Sh-1501	WO.	34x3 1/2	34x5k	Sandow	M 5	4325	Co-B5...	4 1/2x6	B-L.	Ti-6760	WO.	36x0	40x12	
Larrabee	K5 2 1/2	Co-L4.	1 1/2x5 1/2	B-L.	B-L.	Sh-22...	WO.	36x4	36x8	Sanford	10 1/4-1 1/2	Co-SR t.	33/8x5 1/2	B&B.	B-L.	Sa-D...	SB.	33x5n	33x5n	
Larrabee	L4 3 1/2	Co-L1.	1 1/2x5 1/2	B-L.	B-L.	Sh-31...	WO.	36x5	36x10	Sanford	15 1/2-2	Co-N.	34x5	B-L.	Sh-1501	WO.	36x3 1/2	36x5k		
Maccar.	L2 1 1/2	Co-K4.	1 1/2x5 1/2	B-L.	B-L.	Ti-3460	WO.	36x4	36x6	Sanford	25 2-3	Co-C4.	4 1/2x5 1/2	B-L.	Sh-21...	WO.	36x4	36x4		
Maccar.	HA2	Co-K4.	1 1/2x5 1/2	B-L.	B-L.	Ti-6560	WO.	36x4	36x4	Sanford	35 3 1/2-5	Co-E4.	4 1/2x5 1/2	B&B.	B-L.	Sh-31...	WO.	36x5	36x5d	
Maccar.	H23	Co-L4.	1 1/2x5 1/2	B-L.	B-L.	Ti-6666	WO.	36x5	36x6d	Schacht	56 1/2	Co-E4.	4 1/2x5 1/2	B&B.	B-L.	Sh-51...	WO.	36x5	40x6d	
Maccar.	M3 4	Co-L4.	1 1/2x5 1/2	B-L.	B-L.	Ti-6760	WO.	36x4	40x6d	Schacht	2500	Wi.	4x5	Ful.	Wi...	DIR.	36x3 1/2	36x7		
MacDonald.	G 5-6	Co-B2.	1 1/2x5 1/2	B-L.	B-L.	**Own. IG.	IG.	36x6	36x10	Schacht	3200	Wi-UAU	4x5	B&B.	Own...	WO.	36x5	36x5d		
MacDonald.	O 3-5	\$5500b	Bu-WTU	3 1/2x5 1/2	B-L.	B-L.	**Own. IG.	IG.	40x7	40x14	Schacht	3800	Wi-UAU	4x5	B&B.	Own...	WO.	36x5	40x6d	
Mack.	AB 7 1/2	8000b	Bu-YTU	4 1/2x6	B-L.	B-L.	**Own. IG.	IG.	36x6	36x10	Schacht	4400	Wi-VAU	4x5	B&B.	Own...	WO.	36x5	40x6d	
Mack.	AB 1 1/2	3000	Own.	4x5	Own.	Own.	DR.	36x4	36x3 1/2d	Schacht	4600	Wi-VAU	4x5	B&B.	Own...	WO.	34x4	34x3 1/2d		
Mack.	AB 1 1/2	3450	Own.	4x5	Own.	Own.	DR.	36x4	36x4	Schwartz	20 1-11/4	1980	Bu-WTU	3 1/2x5 1/2	B-L.	Ti-6250	WO.	34x5	34x5	
Mack.	AB 2	3300	Own.	4 1/2x5	Own.	Own.	DR.	36x4	36x4	Schwartz	45 1 1/2-3	2840	Bu-GTU	4 1/2x5 1/2	B-L.	Ti-6460	WO.	34x5	34x5d	
Mack.	AB 2	3750	Own.	4 1/2x5	Own.	Own.	DR.	36x4	36x4	Schwartz	46 2 1/2-3	3200	Bu-ETU	4 1/2x5 1/2	B-L.	Ti-6560	WO.	34x5	34x5d	
Mack.	AB 2	3400	Own.	4 1/2x5	Own.	Own.	DR.	36x4	36x4	Schwartz	4800	Bu-BTU	5 1/2x6	B-L.	Ti-6666	WO.	36x6	36x6d		
Mack.	AB 2	3850	Own.	4 1/2x5	Own.	Own.	DR.	36x4	36x4	Schwartz	4890	Bu-BTU	5 1/2x6	B-L.	Ti-6760	WO.	36x6	36x7d		
Mack.	AC 3 1/2	4950	Own.	5x5	Own.	Own.	DR.	36x4	40x5d	Selden	30C 1 1/2	2375	Co-J4.	3 1/2x5	B-L.	Ti...	WO.	36x4	36x7	
Mack.	AC 5	5500	Own.	5x5	Own.	Own.	DR.	36x6	40x6d	Selden	50B 2 1/2	3250	Co-K4.	4 1/2x5 1/2	B-L.	Ti...	WO.	36x4	36x7k	
Mack.	AC 6 1/2	5750	Own.	5x5	Own.	Own.	DR.	36x6	40x12	Selden	53B 2 1/2	3550	Co-L4.	4 1/2x5 1/2	B-L.	Ti...	WO.	36x5	36x10k	
Mack.	AC 7 1/2	6000	Own.	5x5	Own.	Own.	DR.	36x7	37x7	Selden	70B 3 1/2	4175	Co-L4.	4 1/2x5 1/2	B-L.	Ti...	WO.	36x5	36x10k	
Mack.	AC 7 1/2	1200	He.	5x5	War.	FL.	SB.	34x5	34x5	Selden	73	4175	Co-B5.	4 1/2x6	B-L.	Ti...	WO.	36x5	40x12	
Mack.	AC 7 1/2	3400	Own.	4 1/2x5	Own.	Own.	DR.	36x4	36x4	Selden	4950	Co-B5.	4 1/2x6	B-L.	Ti...	WO.	36x5	40x12		
Mack.	AC 7	4950	Own.	5x5	Own.	Own.	DR.	36x5	40x5d	Service	12 3/4	990	Co-B5.	4 1/2x6	B-L.	Ti-5311	SB.	32x3 1/2	32x4 1/2	
Mack.	AC 7	5500	Own.	5x5	Own.	Own.	DR.	36x6	40x6d	Service	25 1/4	3450	Co-B5.	4 1/2x6	B-L.	Ti-1000	SB.	34x5	34x5n	
Mack.	AC 10	5500	Own.	5x5	Own.	Own.	DR.	36x6	40x10	Service	33 1/2	3480	Co-B5.	4 1/2x6	B-L.	Ti-6352	WO.	34x3 1/2	34x6	
Mack.	AC 13	5750	Own.	5x5	Own.	Own.	DR.	36x6	40x12	Service	42 2	3480	Co-B5.	4 1/2x6	B-L.	Ti-6460	WO.	36x4	36x7	
Mack.	AC 15	6000	Own.	5x5	Own.	Own.	DR.	36x7	40x12d	Service	61 3	3480	Co-B5.	4 1/2x6	B-L.	Ti-6560	WO.	36x5	36x8	
Mason.	1 1/2	1200	He.	5x5	War.	FL.	SB.	34x5	34x5	Service	81 4	3480	Co-B5.	4 1/2x6	B-L.	Ti-6666	WO.	36x5	36x10	
Master.	1 1/2	2018	Bu-WTU	3 1/2x5 1/2	Ful.	Ful.	Ti-5511.	SB.	33x5n	33x5n	Service	103 6	990	Co-B5.	4 1/2x6	B-L.	Ti-6780	WO.	36x6	40x12
Master.	21 1/2	Bu-OU	1 1/2x5 1/2	Ful.	Ful.	Ti-6160	WO.	34x4	34x6	Service	12 3/4	990	Co-B5.	4 1/2x6	B-L.	Ti-6800	WO.	36x6	40x12	
Master.	21 1/2	Bu-ETU	1 1/2x5 1/2	Ful.	Ful.	Ti-6560	WO.	34x4	36x8	Service	25 1/4	990	Co-B5.	4 1/2x6	B-L.	Ti-6900	WO.	36x6	40x12	
Master.	21 1/2	Bu-YTU	1 1/2x6	B-L.	B-L.	Ti-6666	WO.	36x5	40x10	Service	33 1/2	990	Co-B5.	4 1/2x6	B-L.	Ti-7000	WO.	36x6	40x12	
Master.	51 3 1/2	Bu-YTU	1 1/2x6	B-L.	B-L.	Ti-6760	WO.	36x5	40x12	Service	42 2	990	Co-B5.	4 1/2x6	B-L.	Ti-7100	WO.	36x6	40x12	
Master.	64 5 6	Bu-ATU	1 1/2x6 1/2	B-L.	B-L.	Ti-6760	WO.	36x6	40x14	Service	61 3	990	Co-B5.	4 1/2x6	B-L.	Ti-7200	WO.	36x6	40x12	
Maxwell.	1 1/2	1095	Own.	3 1/2x4	Own.	Own.	DR.	35x5	35x5	Service	81 4	990	Co-B5.	4 1/2x6	B-L.	Ti-7250	WO.	33x5n	33x5n	
Menominee.	B 1	1650	Wi-SU.	4x5	B&B.	Dot.	Co-5200.	SB.	35x5n	35x5n	Standard	75 1 1/4	1330	Co-N.	3 1/2x5	B-L.	Ti-7352	WO.	34x3 1/2	34x5
Menominee.	HT 1 1/4	2000	Wi-FAU	3 1/2x5	Ful.	Ful.	Ti-800G	IG.	34x3 1/2	36x5k	Standard	1 1/2 K 1 1/2	1690	Co-N.	3 1/2x5	B-L.	Ti-7352	WO.	36x4	36x8
Menominee.	H 1 1/2	2175	Wi-EAU	4x5	Ful.	Ful.	Ti-800H	WO.	36x3 1/2	36x5k	Standard	2 1/2 K 2 1/2	2795	Co-K4.	4 1/2x5 1/2	B-L.	Ti-6666	WO.	36x5	36x12
Menominee.	D 2 1/2	2875	Wi-TAU	1x6	Ful.	Ful.	Ti-800J	WO.	36x4	36x8	Standard	3 1/2 K 3 1/2	3615	Co-L4.	4 1/2x5 1/2	B-L.	Ti-7700	WO.	36x6	40x14
Menominee.	J 5	4850	Wi-RAU	4 1/2x6	B&B.	B&B.	Ti-6760	WO.	36x6	40x12	Star	1/2	6100	Co-B5.	4 1/2x6	B-L.	Ti-7800	WO.	36x6	40x12
Moline.	13 1/2	1695	Own.	3 1/2x5	B&B.	B&B.	To-A...	IG.	31x5n	36x6n	Star	1/2	6100	Co-B5.	4 1/2x6	B-L.	Ti-7800	WO.	36x6	40x12
Moreland.	R.R. 1	1595	He-O.	4x5	B-L.	B-L.	Ti-5512.	IG.	31x5n	34x5n	Star	1/2	6100	Co-B5.	4 1/2x6	B-L.	Ti-7800	WO.	36x6	40x12
Moreland.	BX 1	1980	He-O.	4x5	B-L.	B-L.	Ti-5611.	IG.	31x5n	34x5n	Star	1/2	6100	Co-B5.	4 1/2x6	B-L.	Ti-7800	WO.	36x6	40x12
Moreland.	EX 3	2625	Co-K4.	4 1/2x5 1/2	Own.	Own.	Ti-6161.	WO.	36x4	36x8	Star	1/2	6100	Co-B5.	4 1/2x6	B-L.	Ti-7800	WO.	36x6	40x12
Moreland.	AX 3	3500	Co-L4.	4 1/2x5 1/2	Own.	Own.	Ti-6560.	WO.	36x5	36x10	Star	1/2	6100	Co-B5.	4 1/2x6	B-L.	Ti-7800	WO.	36x6	40x12
Moreland.	RX 5	4600	Co-B5.	4 1/2x6	Own.	Own.	Ti-6666.	WO.	36x6	40x12	Star	1/2	6100	Co-B5.	4 1/2x6	B-L.	Ti-7800	WO.	36x6	40x12
Nash.	2018 1-1 1/2	1595	Own.	3 1/2x5 1/2	B&B.	Cov.	Own.	WO.	35x5n	35x5n	Stewart	15-X 1-1 1/2	1495	Bu-MU	3 1/2x5 1/2	Ful.	Cl-AW.	IG.	35x5n	35x5n
Nash.	4017 2-2 1/2	2750	Bu-IIU	4 1/2x5	Ful.	Ful.	Co-D.	IG.	34x4	34x7	Stewart	9 1 1/2-2	1870	Co-N.	3 1/2x5	Ful.	Cl-ID.	IG.	34x3 1/2	34x6
Nash.	3013 2-2 1/2	2150	Own.	3 1/2x5 1/2	B&B.	Cov.	DR.	34x4	34x7	Stewart	7K 2 1/2-3	2590	Bu-HTU	4 1/2x5 1/2	Ful.	Cl-2D.	IG.	34x4	36x12	
Nash.	5018 2 1/2	2250	Own.	3 1/2x5 1/2	B&B.	Cov.	DR.	34x4	34x7	Stewart	10X 3 1/2-4	3440	Bu-YTU	4 1/2x5 1/2	Ful.	Cl-3D.	IG.	30x5	36x12	
Noble.	A-7 1/2	1335	Bu-WTU	3 1/2x5 1/2	Ful.	Ful.	Sh-1501.	WO.	34x5	34x5	Stewart	AS 3 1/2-4	1185	Co-M.	3 1/2x4	B-L.	Co-52000.	SB.	34x3 1/2	34x4 1/2
Noble.	A-21 1 1/4	1897	Bu-WTU	3 1/2x5 1/2	Ful.	Ful.	Sh-103.	IG.	36x4	36x7	Stewart	AS 1 1/2-2	2100	Bu-WA	3 1/2x5 1/2	B-L.	Co-52000.	SB.	34x5	36x10
Noble.	B-31 2	3795	Bu-CTU	4 1/2x6	Ful.	Ful.	Ti-6666.	WO.	36x4	36x8</td										

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		REAR AXLE	TIRES	MAKE AND MODEL	Tons Capacity	ENGINE		REAR AXLE	TIRES		
			Make & Model	Bore & Stroke					Clutch Make	Gearset Make				
Walter.....	12	\$3600	Own....	4x5 $\frac{1}{4}$	B-L....	DR....	36x4	36x8	Getredson....	20 $\frac{1}{4}$ -1	\$1685	Bu-WTU	34x5 $\frac{1}{2}$	
Walter.....	55	5100	Own....	4 $\frac{1}{2}$ x6 $\frac{1}{2}$	B-L....	DR....	36x6	40x6d	Getredson....	40 $\frac{1}{4}$ -2	2300	Bu-GTU	4x5 $\frac{1}{2}$	
White.....	15 $\frac{3}{4}$	2400	Own....	33x4 $\frac{1}{2}$	Own....	Own....	34x5n	34x5n	Getredson....	50 $\frac{1}{2}$ -2	3000	Bu-Eu	4x5 $\frac{1}{2}$	
White.....	20 $\frac{1}{2}$	3250	Own....	33x4 $\frac{1}{2}$	Own....	Own....	36x4	36x7d	Getredson....	50 $\frac{1}{2}$ -2	3975	Bu-YTU	4x5 $\frac{1}{2}$	
White.....	40 $\frac{1}{2}$	4200	Own....	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	Own....	Own....	36x5	40x5d	Getredson....	88 $\frac{1}{2}$	4800	Mapleleaf	5x6 $\frac{1}{2}$	
White.....	45 $\frac{1}{2}$	4500	Own....	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	Own....	Own....	36x6	40x6d	Mapleleaf	100 $\frac{1}{2}$	3000	Mapleleaf	5x6 $\frac{1}{2}$	
Wilex.....	A $\frac{1}{2}$	1900	Bu-CTU	33x4 $\frac{1}{2}$	B-L....	Ru-3600	SP....	35x5	35x5	Mapleleaf	11 $\frac{1}{2}$	3000	Hi-300	33x4 $\frac{1}{2}$
Wilex.....	BB $\frac{1}{2}$	2550	Own....	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	B-B....	Own....	36x6	38x7	Mapleleaf	AA $\frac{1}{2}$	3600	Hi-400	4x5 $\frac{1}{2}$	
Wilex.....	CC $\frac{1}{2}$	3000	Own....	4 $\frac{1}{2}$ x5 $\frac{1}{2}$	B-B....	Own....	36x6	40x8	Mapleleaf	BB $\frac{1}{2}$	4050	Hi-500	4x5 $\frac{1}{2}$	
Wilex.....	EE $\frac{1}{2}$	3350	Bu-YTU	19x26	M&E....	Own....	36x5	36x10	Mapleleaf	CC $\frac{1}{2}$	4800	Hi-200	4x5 $\frac{1}{2}$	
Wilex.....	F $\frac{1}{2}$	4350	Bu-ATU	19x26	M&E....	Own....	36x5	40x8	Mapleleaf	DD $\frac{1}{2}$	5625	Hi-1600	4x5 $\frac{1}{2}$	
Wilson.....	C $\frac{1}{2}$	1350	He-O	1 x 5	B-B....	Det....	Ti-6532	WO....	34x5n	National	FA $\frac{1}{2}$	2699	Wa-BUX	34x5 $\frac{1}{2}$
Wilson.....	F $\frac{1}{2}$	2270	Co-J $\frac{1}{2}$	33x4 $\frac{1}{2}$	B-B....	Cot....	Ti-6660	WO....	36x5k	National	GA $\frac{1}{2}$	3600	Wa-BUX	34x5 $\frac{1}{2}$
Wilson.....	EA $\frac{1}{2}$	2825	Co-K $\frac{1}{2}$	41x5 $\frac{1}{2}$	B-B....	Cot....	Ti-6762	WO....	36x6k	National	HD $\frac{1}{2}$	3600	Wa-CU	4x5 $\frac{1}{2}$
Wilson.....	G $\frac{1}{2}$	3685	Co-L $\frac{1}{2}$	41x5 $\frac{1}{2}$	B-B....	Cot....	Ti-6752	WO....	36x6k	National	HB $\frac{1}{2}$	3600	Wa-DU	4x5 $\frac{1}{2}$
Wilson.....	H $\frac{1}{2}$	4520	Co-B $\frac{1}{2}$	41x6	B-B....	Cot....	Ti-6752	WO....	36x6k	National	OA $\frac{1}{2}$	3600	Wa-EU	5x6 $\frac{1}{2}$
Yellow Cab. M22	2 $\frac{1}{2}$	1590	Co-V $\frac{1}{2}$	33x4 $\frac{1}{2}$	B-L....	B-L....	Ti-5762	SB....	33x4 $\frac{1}{2}$ n	Yellow Cab. M22	1	1800	Bu-CTU	34x5 $\frac{1}{2}$
Yellow Cab. M42	1 $\frac{1}{2}$	1640	Co-V $\frac{1}{2}$	33x4 $\frac{1}{2}$	B-L....	B-L....	Ti-6352	WO....	35x5n	Yellow Cab. M42	2 $\frac{1}{2}$	1740	Co-V $\frac{1}{2}$	33x4 $\frac{1}{2}$
Yellow Cab. M42	1-1 $\frac{1}{2}$	1740	Co-V $\frac{1}{2}$	33x4 $\frac{1}{2}$	B-L....	Ti-6352	WO....	35x5n	Yellow Cab. M42	1-1 $\frac{1}{2}$	1740	Co-V $\frac{1}{2}$	33x4 $\frac{1}{2}$	

Current Tractor Specifications

MAKE & MODEL	Drawbar-Pully Rating	Recommended No. of 14 Ins. Plows	Price	ENGINE		MAKE & MODEL	Drawbar-Pully Rating	Recommended No. of 14 Ins. Plows	ENGINE		MAKE & MODEL	Drawbar-Pully Rating	Recommended No. of 14 Ins. Plows	Price	ENGINE			
				Make	No. of Cyls. Bare & Stroke		Make	No. of Cyls. Bare & Stroke	Make	No. of Cyls. Bare & Stroke	Make		No. of Cyls. Bare & Stroke	Make				
Allis-Chalmers.....	6-12	1	\$295	LeR....	4-3x4 $\frac{1}{2}$	2500	Gray....	DU	18-36	4	2150	Wau....	4-4x6	6200	1	Rumaly OilPull		
Allis-Chalmers.....	15-25	3	1185	Mid....	4-4x5 $\frac{1}{2}$	4700	Gray....	EU	22-40	4	2385	Wau....	4-5x6	6000	8-10	Russell		
Allis-Chalmers.....	20-35	4	1885	Own....	4-4x6 $\frac{1}{2}$	6150	50x12	Hart-Parr....	20	2	Own....	2-5x6	4438	46x10	3-4	Russell		
Allwork.....	D 29-38	4	1095	Own....	4-5 $\frac{1}{2}$	5600	48x14	Hart-Parr....	30	3	Own....	2-6x7	7560	52x18	8-10	Shaw-Eeno (Gr.)		
Allwork.....	G 11-28	3	1195	Own....	4-5x6	4800	48x12	Hart-Parr. (Road)	30	3	Own....	2-6x7	6000	57x12	3-4	Topp-Stewart, B		
Allwork.....	C 16-30	3	1295	Own....	4-5x6	5200	48x12	Heider....	12	16	Wau....	4-4x5 $\frac{1}{2}$	4000	54x8	6-10	Toro		
Aultman-Taylor.....	15-30	3-4	1900	Cli....	4-5 x 6 $\frac{1}{2}$	7800	70x12	Heider....	12-20	3	Wau....	4-4x6	6000	57x12	10-20	Townsend		
Aultman-Taylor.....	22-45	4-6	3100	Own....	4-5 x 6 $\frac{1}{2}$	12500	70x20	Heider....	5-10	1	LeR....	4-3x4 $\frac{1}{2}$	2800	46x6	2-3	Townsend		
Aultman-Taylor.....	19-60	8-10	1400	Own....	4-7 x 9	22500	70x24	Huber....	12-25	2	Wau....	4-4x5 $\frac{1}{2}$	5000	60x10	3-4	Townsend		
Avery.....	15	3-4	...	Own....	4-4x6	4750	50x12	Huber....	15-30	3	Mid....	4-4x6	6000	60x10	4-5	Traylor		
Avery.....	20-35	4-5	...	Own....	4-4x7	7500	60x16	Lauson....	12-25	3	Bea....	4-4x5 $\frac{1}{2}$	4200	...	6-12	Wau....		
Avery.....	25-50	5-6	...	Own....	6-6x7	12500	69x20	Lauson....	15-30	4	LeR....	4-3x4 $\frac{1}{2}$	6200	...	12-20	1200		
Avery.....	45-65	8-10	...	Own....	7-7x8	22000	87x21	Leader....	12-18	2	Own....	2-6x12	4800	50x12	3-4	1200		
Avery. Tr. Runner.....	3	...	Own....	4-4x5 $\frac{1}{2}$	5000	x 8	Leader....	16-32	3-4	1275	Ch....	4-5 x 6	5800	52x12	12-20	1200		
Avery. RoadRazer.....	60	9	Own....	6-6x7	4600	42x6	Leader....	GU	16-32	3-4	2500	Ch....	4-5 x 6	5800	52x12	12-20	1200	
Bates (St. Mule) H.....	15-25	3	Mid....	4-4x5 $\frac{1}{2}$	3600	48x10	Lincoln....	15-30	3	1600	Bud....	4-4x6	5000	40x14	3-4	Rumaly OilPull		
Bates (St. Mule) I.....	18-25	3	Mid....	4-4x5 $\frac{1}{2}$	4850	56x10	Lincoln....	15-30	3	1600	Bud....	4-4x6	5000	40x14	3-4	Russell		
Bates (St. Mule) G.....	25-35	4	Mid....	4-4x6	6500	x 10	Little Giant....	B	18-22	4	Own....	4-4x6	5200	54x14	8-10	Russell		
Bates (St. Mule) G.....	30-40	5	Mid....	4-4x6	8500	*84x10	Little Giant....	A	26-35	6	Own....	5-5x7	8700	66x20	8-10	Shaw-Eeno (Gr.)		
Bear.....	25-35	4	Ste....	4-4x6 $\frac{1}{2}$	6000	64x12	Lombard....	100	12-16	Own....	6-5x7	19000	12x12	8-10	Topp-Stewart, B			
Best.....	30	3-4	...	Own....	4-4x6 $\frac{1}{2}$	8100	68x11	London....	12-25	3	Mid....	4-4x5 $\frac{1}{2}$	4800	...	6-10	Toro		
Best.....	60	10-60	9	Own....	6-6x7	18580	89x20	McCormick-Deering....	10-20	2	850	Wau....	4-4x5 $\frac{1}{2}$	3700	42x12	12-20	1200	
Bryan.....	Steam	15-30	3	2503	Own....	2-4 x 5	McCormick-Deering....	15-30	3	1250	Wau....	4-4x6	5750	50x12	3-4	1200		
Case.....	12-20	3-20	3	1035	Own....	4-4x5	4230	42x12	Minneapolis....	12-25	3	Own....	4-4x7	6600	56x12	3-4	1200	
Case.....	15-27	2-34	3	1351	Own....	4-4x6	6600	52x14	Minneapolis....	17-30	3-4	Own....	4-4x7	6100	54x12	3-4	1200	
Case.....	22-40	4-5	4-5	2651	Own....	5-5x6 $\frac{1}{2}$	10700	56x16	Minneapolis....	22-44	4-5	Own....	4-4x7	12410	62x20	3-4	1200	
Case.....	40-72	8-12	8-1	1933	Own....	7-7x8	21200	72x20	Minneapolis....	35-70	8-10	Own....	7-7x8	22500	88x30	3-4	1200	
Caterpillar. 2 Ton	3	...	Own....	4-4x5 $\frac{1}{2}$	4000	...	Melvin (Unr.)	D	9-8	2-3	725	Own....	4-3x5	4103	52x 8	3-4	1200	
Caterpillar. 5 Ton	35	4	...	Own....	4-4x6	9400	48x12	Melvin (Orc.)	D	9-8	2-3	725	Own....	4-3x5	3893	48 x 8	3-4	1200
Cletrac.....	F 9-16	2	815	Own....	4-3x4 $\frac{1}{2}$	1930	42x 5	Monarch....	E	25-40	4	5000	Wau....	4-4x6	1700	67x12	3-4	1200
Cletrac.....	W 12-20	2	1315	Own....	4-4x5 $\frac{1}{2}$	3455	48x 8	Monarch....	D	35-60	...	6000	Bud....	4-4x6	15000	89x12	3-4	1200
Eagle.....	F 12-22	3	...	Own....	2-7 x 8	5850	48x12	Nichols-Shepard....	20-42	4-6	2600	Own....	2-8x10	13500	64x20	3-4	1200	
Eagle.....	H 16-30	4	...	Own....	2-8 x 8	7100	48x12	Nichols-Shepard....	25-50	6-8	3320	Own....	2-9x12	20500	69x28	3-4	1200	
Eagle.....	E 12-20	3	...	Own....	4-4x5	4550	54x12	Nichols-Shepard....	35-70	8-12	4030	Own....	2-10x14	30000	73x22	3-4	1200	
Eagle.....	Q 12-20	3	...	Own....	4-4x5	6500												

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES										NAME AND MODEL	ENGINE			ELECTRICAL SYSTEM		GEAR SET MAKE	UNIVERSAL TYPE AND MAKE	REAR AXLE	BRAKES, SERVICE AND EMERGENCY			
OPEN MODELS			CLOSED MODELS			WHEEL BASE (In.)		TIRES (In.) [†]			MAKE AND MODEL	NO. OF CYL. BORE AND STROKE	HP. RATING (N.A.A.C.)	CARBURETOR MAKE	GENERATOR AND STARTER MAKE	IGNITION MAKE						
\$1950c	\$1785	\$1850	\$1835	\$2250	\$2485	127	33x4 ¹ ₂	American	D-66	H-S. 11000	6-3 ¹ ₂ x5	29.40	Strom.	G-D.	s-p	B&B.	B & B.	m Hart.	F	Salis.	4.50	R-L-T ²
1195	1195	1395c	[1195	1195	1195	114	32x4	Anderson	41	Cont. 6 Y	6-3 ¹ ₂ x4 ¹ ₂	23.44	Zenith	West.	s-p	B&B.	Durston.	f Univ.	1/2F Salis	4.75	R-L-T ¹	
1495	1495	1595	[1785b	1095c	1095d	122	32x4	Anderson	Series 50	Cont. 8 R	6-3 ¹ ₂ x4 ¹ ₂	27.34	Rayfield.	Remy.	s-p	B&B.	Durston.	f Univ.	1/2F Salis	4.62	R-L-T ¹	
1535	1535	1535	1535	2200	132	33x4	Anderson	Series 50	Cont. 8 R	6-3 ¹ ₂ x4 ¹ ₂	27.34	Rayfield.	Remy.	s-p	B&B.	Durston.	f Univ.	1/2F Salis	4.62	R-L-T ¹		
2125	2125	2125	2125	3385	130	33x5	Apperson	6	Own.	6-3 ¹ ₂ x4 ¹ ₂	23.44	Strom.	Remy.	s-p	B&B.	Durston.	f Univ.	1/2F Col.	5.10	R-L-T ¹		
1095	1095	1325d	1495c	1495	114	31x4	Auburn	6-43-S	Cont. 6 Y	6-3 ¹ ₂ x4 ¹ ₂	23.44	Strom.	Remy.	s-p	B&B.	Warner.	m Thie.	1/2F Own.	4.25	R-L-T ¹		
1595	1595	185d	185d	2345	124	33x4 ¹ ₂	Auburn	6-6-63	Own.	6-3 ¹ ₂ x4 ¹ ₂	25.35	Strom.	Remy.	s-p	B&B.	Warner.	m Thie.	1/2F Col.	4.60	R-L-T ¹		
1395	1395	1495d	[1850	[2250p	118	32x4	Barley	1924	Cont. 6 Y	6-3 ¹ ₂ x4 ¹ ₂	23.44	Strom.	Deleo.	s-p	B&B.	Fuller.	f M&E.	1/2F Col.	5.10	R-L-T ¹		
935	935	800	1395c	1495	109	31x4	Buick	1924	Own.	6-3 ¹ ₂ x4 ¹ ₂	18.23	Marvel.	Deleo.	m-d	Own.	Own.	m Own.	1/2F Own.	4.60	F-L-R ¹		
1275	1275	1295	1335	1995c	120	32x4	Buick	1924	Own.	6-3 ¹ ₂ x4 ¹ ₂	27.31	Marvel.	Deleo.	m-d	Own.	Own.	m Own.	F Own.	3.10	F-L-R ¹		
1385	1385	1565	[1675a	[1725d	2235	128	33x4 ¹ ₂	Buick	1924	Own.	6-3 ¹ ₂ x4 ¹ ₂	27.34	Marvel.	Deleo.	m-d	Own.	Own.	m Own.	F Own.	4.70	F-L-R ¹	
2985	2985	3875	3950	[4400	132	33x5	Cadillac	V 63	Own.	8-3 ¹ ₂ x5 ¹ ₂	31.25	Own.	Deleo.	m-d	Own.	Own.	m Spicer	F Tim.	Opt.	F-L-R ¹		
1750	1790	2230d	2480c	2575	122	32x4 ¹ ₂	Case	X	Cont. 8 R	6-3 ¹ ₂ x4 ¹ ₂	27.34	Ruyfield.	Deleo.	m-d	Own.	Own.	f Snead.	1/2F Col.	5.05	R-L-R ¹		
1185	1185	1990	1950c	3325	129	33x5	Case	Y	Cont. 6 T	6-3 ¹ ₂ x4 ¹ ₂	31.54	Rayfield.	Deleo.	m-d	Own.	Own.	f Snead.	1/2F Col.	4.09	R-L-R ¹		
1595	1595	1295	1335d	1535	117	32x4	Chalmers	1923	Own.	6-3 ¹ ₂ x4 ¹ ₂	25.35	Strom.	A-L.	Remy.	m-d	Own.	Own.	m Hardy.	1/2F Ad.	5.13	R-L-R ¹	
1485	1485	1615	1785c	1785	122	32x4	Chalmers	1923	Own.	6-3 ¹ ₂ x4 ¹ ₂	25.35	Strom.	A-L.	Remy.	m-d	Own.	Own.	m Hardy.	1/2F Ad.	5.13	R-L-R ¹	
490	495	395g	400	795	103	30x3 ¹ ₂	Chevrolet	Superior	Own.	4-3 ¹ ₂ x4 ¹ ₂	21.76	Zenith.	Remy.	s-p	Own.	Own.	m Own.	1/2F Own.	3.77	R-L-R ¹		
1085	1015	[1145d	1215	1385	112	31x4	Cleveland	42	Own.	6-3 ¹ ₂ x4 ¹ ₂	22.50	Strom.	A-L.	Bosch.	s-p	B&B.	Own.	m Mech.	1/2F Own.	4.90	R-L-T ¹	
2175	2175	2750c	3075	3075	127	32x4 ¹ ₂	Cole	Master	Nort. M309	8-3 ¹ ₂ x4 ¹ ₂	39.20	Johnson.	Delco.	m-d	Nort.	Nort.	m Spicer	F Col.	4.70	R-L-R ¹		
985c	985c	1195d	1250c	1995	115	32x4	Columbia	Big Six	Cont. 8 R	6-3 ¹ ₂ x4 ¹ ₂	27.34	Strom.	A-L.	s-p	B&B.	Durston.	m Spicer	1/2F Tim.	4.75	R-L-R ¹		
985c	985c	1495d	1395	1995	115	31x4	Columbia	Light Six	Cont. 6 Y	6-3 ¹ ₂ x4 ¹ ₂	23.44	Strom.	A-L.	s-p	B&B.	Durston.	m Spicer	1/2F Tim.	5.10	R-L-T ¹		
1395p	1395p	1505c	1495	2105p	1895t	116	32x4	Courier	1925	Falls. 8000	6-3 ¹ ₂ x4 ¹ ₂	23.44	Strom.	West.	A-K.	s-p	B&B.	Munie.	f Flex.	1/2F Col.	5.10	R-L-R ¹
3100	3100	4500	4500	4500	138	33x4 ¹ ₂	Crawford	23-6-70	Cont. 6 T	6-3 ¹ ₂ x5 ¹ ₂	31.54	Zenith.	West.	Bosch.	m-d	B-L.	B-L.	m Spicer	1/2F Tim.	... R-L-R ¹		
5800	5800	3500c	4500	4500	138	33x5	Crawford-Dagmar	6-70	Cont. 6 T	6-3 ¹ ₂ x5 ¹ ₂	31.54	Zenith.	West.	Bosch.	m-d	B-L.	B-L.	m Spicer	1/2F Tim.	... R-L-R ¹		
5000	4650	4700	4650c	6350	6450	132	33x5	Cunningham	V 4	Own.	8-3 ¹ ₂ x5 ¹ ₂	45.00	Strom.	Deleo.	m-d	Own.	Own.	m Own.	F Tim.	4.23	R-L-R ¹	
5000	5150	6000	6000	6800	138	33x5	Daniels	23-38	Own.	8-3 ¹ ₂ x5 ¹ ₂	39.20	Zenith.	Deleo.	m-d	Own.	Own.	m Spicer	F Tim.	4.23	R-L-R ¹		
1295	1295	1495c	1495	1595	115	31x4	Daniels	23-38	Own.	6-3 ¹ ₂ x5 ¹ ₂	39.20	Zenith.	Deleo.	m-d	Own.	Own.	m Spicer	F Tim.	4.23	R-L-R ¹		
1595	1595	1605d	2095	120	120	32x4 ¹ ₂	Davis	71	Cont. 7 U	6-3 ¹ ₂ x4 ¹ ₂	23.44	Strom.	Deleo.	s-p	B&B.	Warner.	m M&E.	1/2F Tim.	5.10	R-L-R ¹		
850	850	730g	1035	1250	116	32x4	Dodge Brothers	...	Cont. 8 R	6-3 ¹ ₂ x4 ¹ ₂	27.34	Strom.	Deleo.	s-p	B&B.	Warner.	m Peters.	1/2F Tim.	5.10	R-L-R ¹		
3950	3950	4150c	1995c	5500	136	33x5	Dorris	6-80	Own.	6-4 x 5	38.40	Strom.	West.	Bosch.	m-d	Own.	Warner.	m Spicer	1/2F Tim.	4.23	R-L-R ¹	
870	870	995c	1210	1350	108	31x4	Dort	23-18	Lyo. KB	4-3 ¹ ₂ x5	19.60	Carter.	Bosch.	m-d	Det.	Own.	m Mech.	3/4F Fln.	4.66	R-L-R ¹		
1010	1010	1135c	1355	1465	115	31x4	Dort	25-20	Walla T8000	6-3 ¹ ₂ x4 ¹ ₂	23.44	Carter.	Bosch.	m-d	Det.	Own.	m Mech.	3/4F Fln.	4.66	R-L-R ¹		
5750	5750	8900	5750c	7250	131	33x5	Duessenberg	Straight 8	Own.	8-2 ¹ ₂ x5	26.45	Strom.	Deleo.	s-p	Own.	Own.	m Cli.	1/2F Own.	4.45	F-L-D ¹		
850	850	1065d	1365	1465	109	31x4	Durant	A-22	Cont. Spec.	4-3 ¹ ₂ x4 ¹ ₂	24.03	Till.	A-L.	s-p	Own.	Warner.	m Spicer	1/2F Ad.	4.33	R-L-R ¹		
1600	1600	2250	2400	123	123	32x4 ¹ ₂	Durant	D-22	Aust. D	6-3 ¹ ₂ x4 ¹ ₂	25.35	Ruyfield.	A-L.	s-p	Anst.	Warner.	m f Spi.	1/2F Tim.	5.15	R-L-R ¹		
1485	1095	1275d	1305c	1595	112	32x4	Earl	40	Own.	4-3 ¹ ₂ x4 ¹ ₂	18.01	Scoe.	A-L.	Conn.	s-p	B&B.	Own.	f Own.	1/2F Own.	4.87	R-L-T ¹	
995	995	1135d	1225	1425	112	31x4	Elcar	44-40	Y.	4-3 ¹ ₂ x5	21.03	Strom.	Deleo.	s-p	B&B.	Warner.	m Peters.	3/4F Salis.	4.50	R-L-R ¹		
1395	1395	1595d	1595	1995d	118	32x4	Elcar	6-60	Cont. 8 R	6-3 ¹ ₂ x4 ¹ ₂	27.34	Strom.	Deleo.	s-p	B&B.	Warner.	m Spicer.	1/2F Salis.	4.50	R-L-R ¹		
1045	1045	1145	1145	108	108	32x4 ¹ ₂	Estey	...	Own.	4-3 ¹ ₂ x5	18.23	Own.	Bosch.	m-d	Own.	Own.	m Spicer.	1/2F Own.	4.66	R-L-R ¹		
1195	1195	236g	1195	1895c	120	32x4 ¹ ₂	Flint	...	Cont. Spec.	6-3 ¹ ₂ x5	27.34	Strom.	Dejon.	s-p	Own.	Warner.	m Spicer.	1/2F Ad.	... R-L-R ¹			
2975	2975	3975	3975	132	132	32x4 ¹ ₂	Fox	Air-Cooled	Own.	6-3 ¹ ₂ x5	27.34	Strom.	West.	Scintilla.	m-d	B-L.	B-L.	m Spicer.	1/2F Tim.	4.90	R-L-R ¹	
1950	1950	12750c	2250	29500	115	32x4	Franklin	10	Own.	6-3 ¹ ₂ x4 ¹ ₂	25.35	Own.	A-K.	s-p	B&B.	Own.	m Spicer.	1/2F Own.	4.73	T-R ¹		
905	905	1145c	1145	1445	112	32x4	Gardner	Series 5	Lyc. CE	4-3 ¹ ₂ x5	21.76	Zenith.	West.	West.	s-p	B&B.	Mech.	m Peters.	3/4F Fln.	4.80	R-L-T ¹	
490	490	750	750	835	100	30x3 ¹ ₂	Gray	...	Owp.	4-3 ¹ ₂ x5	21.03	Scoe.	West.	West.	s-p	Own.	Own.	m Mech.	3/4F Tim.	3.90	R-L-T ¹	
2250	2250	285J	2640	120	120	32x4 ¹ ₂	H.C.S.	Series 4	Weid.	4-3 ¹ ₂ x5	22.50	Strom.	Deleo.	m-d	B-L.	B-L.	m Spicer.	3/4F Own.	4.63	R-L-R ¹		
1395	1395	1495c	1495	2195	121	32x4	H.C.S.	Series 6	Midw.	6-3 ¹ ₂ x5	29.40	Strom.	Deleo.	m-d	B-L.	B-L						

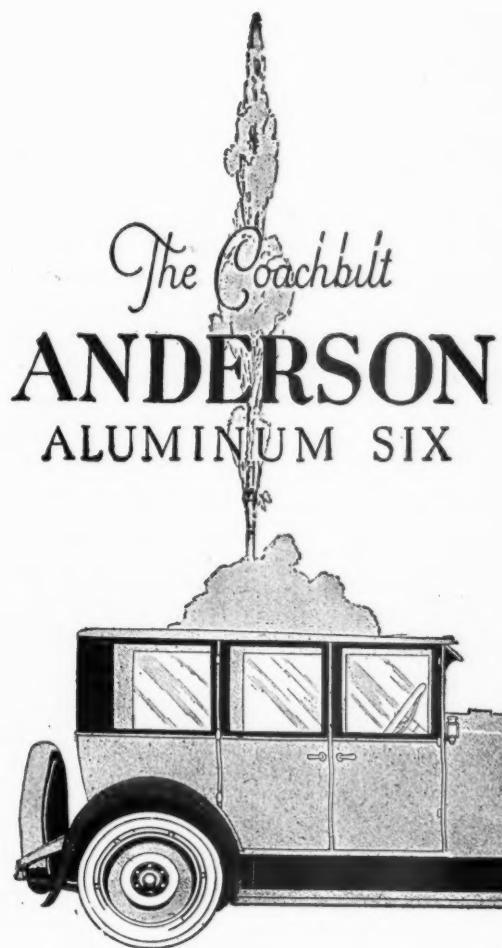
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Specifications
(Sedan Model)

Coachbilt Anderson Aluminum Body; 6 Cylinder Red Seal Continental Motor; Westinghouse Starting, Lighting and Ignition; Borg & Beck Clutch; Cord Tires; Alemite Lubrication; Snubbers; Motometer; Wind Shield Cleaner; Wind Shield Shade; Foot Dimmer for Headlights; Cowl Ventilator; Heater; Foot Rest; Vanity Set; Dome Light; Reading Lamp. Averages 19 miles per gallon of gas; Wheelbase, 115 inches; Color—Maroon body with black mud guards.

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Anderson Motor Co., Rock Hill, S. C.

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES										NAME AND MODEL	ENGINE			ELECTRICAL SYSTEM			REAR AXLE					
OPEN MODELS			CLOSED MODELS			Wheel Base (In.)	Tire Size (In.)	Make and Model	No. of Cyl. Bore and Stroke	Horse Power Rating (N.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make	Clutch Type and Make	Gearset Make	Universal Type and Make	Type and Make	Gear Ratio	BRAKES, Service and Emergency			
2-3 Pass.	4-5 Pass.	6-7 Pass.	Sport Models	2-3 Pass.	4-5 Pass.	6-7 Pass.																
2385	1885	2385	2385c	2375	3075	124	32x4½	Kissel	45	Own.....	6-3½x5½	26.38	Strom...	Remy.	Remy.	m-d War...	Warner.	m Spicer	F	Own	3.92 R-L-R	
5000	5000	5000	4200c	6300	6500	132	33x5	LaFayette	Own.....	8-3½x5½	33.80	Johnson	Deleo.	Deleo.	m-d Own...	Own...	m Own.	F	Own	4.58 R-L-R	
1795	1795	1795	2145c	2345	2345	123	32x4½	Lexington	23	Anst....C	6-3½x4½	25.35	Rayfield	G-D.	Conn.	m-d Own...	Warner.	f Sneed.	F	Salis	5.10 R-L-T	
3800	3800c	3800	4600c	4400	4900	136	33x5	Lincoln	Own.....	8-3½x5	36.45	Strom...	Deleo.	Deleo.	m-d Own...	Own...	m Spicer	F	Tim	4.58 R-L-R
8800	9500c	9600	11750	11600	142	35x5	Locomobile	Series 8	Own.....	6-4½x5½	48.60	Ball&B.	West.	Deleo.	m-d Own...	Own...	m Own.	F	Own	3.85 R-L-R	
3385	3185	3185	.....	4385	4385	136	32x4½	Marmon	34	Own.....	6-3½x5½	33.75	Strom...	Deleo.	Deleo.	m-d Own...	Own...	m Spicer	½F Own	4.10 R-L-R	
3510	3310	3310	.....	4510	4510	136	32x4½	Marmon	34	Own.....	6-3½x5½	33.75	Strom...	Deleo.	Deleo.	m-d Own...	Own...	m Spicer	½F Own	4.10 R-L-R	
795	795	p960d	895	935	1195	109	31x4	Maxwell	.....	Own.....	4-3½x4½	21.03	Stewart.	Remy.	Remy.	e Own...	Own...	f Own.	½F Own	4.60 R-L-T	
5400	5600	5700	6720	6600c	6810	140	33x5	McFarlan	1923	Own.....	6-4½x6	48.60	Rayfield	West.	West.	m-d M&E	B-L...	m Peters	F	Tim	3.75 R-L-R
3950b	3950c	3950e	4850	5250	132	32x4½	Mercer	Series 5	Own.....	4-3½x6½	22.50	Ball&B.	West.	Eisem.	m-d Own...	Own...	m Spicer	F	Own	3.87 T-L-R	
3750c	3750c	4700	5000	132	32x4½	Mercer	6	.....	Own.....	6-3½x5	33.75	Strom...	West.	Eisem.	m-d Own...	Own...	m Spicer	½F Own	3.77 T-L-R		
1205	1295	1495c	1585c	1695	1695	115	31x4	Moon	U-40	Cont....Y	6-2½x4½	23.44	Strom...	Deleo.	Deleo.	s-p B&B.	Warner.	m Spicer	½F Tim	5.10 R-L-T		
.....	1785	1995c	2385	2485	128	32x4½	Moon	6-58	.....	Cont....8 R	6-3½x4½	27.34	Strom...	Deleo.	Deleo.	s-p B&B.	B-L...	m Spicer	½F Tim	5.09 R-L-R	
1240	1240	1645c	2090	121	33x4	Nash	691-3-6-7	.....	Own.....	6-3½x5	25.35	Marvel	Deleo.	Deleo.	s-p B&B.	Own...	m Own.	½F Own	4.50 R-L-T		
915	935	1195	1195	1890	2190	127	31x4½	Nash	692-4-5-8	Own.....	6-3½x5	25.35	Marvel	Deleo.	Deleo.	s-p B&B.	Own...	m Own.	½F Own	4.90 R-L-T	
945	945	1095	1195	1345	113	31x4	Oakland	6-54	Own.....	6-2½x4½	19.00	Marvel	Remy.	Remy.	e Hoos.	Muncie.	m Mech.	½F Own	4.70 R-L-T			
750	750	.....	955	1035	110	31x4	Oldsmobile	6	Own.....	6-2½x4½	18.15	Zenith	Deleo.	Deleo.	s-p B&B.	Own...	f Ther.	½F Own	4.70 R-L-T		
495	495	305g	750	795	100	30x3½	Overland	91	Own.....	4-3½x4	10.60	Till...	A-L...	A-L...	s-p B&B.	Own...	m Own.	½F Own	4.50 R-L-R			
605	.....	.....	.....	106	106	30x3½	Overland	92	Own.....	4-3½x4	19.60	Till...	A-L...	A-L...	s-p B&B.	Own...	m Own.	½F Own	4.50 R-L-R	
2485	2485	2650c	3175c	3275	3350d	126	33x4½	Packard	126	Own.....	6-3½x5	27.34	Own...	A-K...	Deleo.	m-d Own...	Own...	m Spicer	½F Own	4.66 R-L-R		
3850	3650	3650	3525f	3575c	133	33x4½	Packard	133	.....	Own.....	6-3½x5	27.34	Own...	A-K...	Deleo.	m-d Own...	Own...	m Spicer	½F Own	4.66 R-L-R	
2895	2450	2450	4900c	4950c	133	33x5	Packard	136	.....	Own.....	6-3½x5	36.45	Own...	Dyneto.	Deleo.	m-d Own...	Own...	m Spicer	½F Own	4.70 R-L-R	
1550	1300	1425	1465d	2205d	2395	120	32x4½	Paterson	23-6-52	Cont....8 R	6-3½x4½	27.34	Strom...	Deleo.	Deleo.	s-p B&B.	Durston.	m Hart.	½F Salis	4.50 R-L-R		
2600	2600	2750	2260c	3300	3390	128	33x5	Peerless	23	Own.....	8-3½x5	33.80	Ball&B.	Deleo.	Deleo.	m-d Own...	Own...	m Spicer	½F Tim	4.90 R-L-R		
5250	5250	5250	6800	6900	6800	138	33x5	Pierce-Arrow	.....	Own.....	6-4 x5½	38.40	Own...	Deleo.	Deleo.	m-d Own...	Own...	m Spicer	½F Own	4.29 R-L-R	
1695	1745	1745	2445	2445	120	32x4½	Pilot	6-50	H-S... 90	6-3½x5	25.35	Till...	Wagner.	Wagner.	s-p B&B.	Muncie.	m Blood.	½F Col.	4.67 R-L-R			
2535	2535	2585d	2635d	3385	126½	32x4½	Premier	6-D	Own.....	6-3½x5½	27.34	Strom...	Deleo.	Deleo.	s-p B&B.	Own...	m Spicer	½F Tim	4.58 R-L-R			
2300	2300	2375	2400c	3000d	3050	124	32x4½	R & V Knight	H	Own. Kn't	6-3½x4½	29.40	Strom...	A-L...	A-L...	s-p B-L.	B-L...	m Spicer	½F Tim	5.40 R-L-R		
1335	1335	1545d	1885d	3250	120	32x4	Reo	T6	.....	6-3½x5	24.34	Rayfield.	A-L...	N.E.	m-d Own...	Own...	m Own.	½F Own	4.70 R-L-R		
3200c	3200	3200c	4000	131	32x4½	Revere	M	Duen	.....	6-4½x5½	30.63	Strom...	West.	Bosch.	m-d B-L.	B-L...	m Spicer	½F Stand	3.44 R-L-R		
1485	1485	1885c	1985	117	32x4	Rickenbacker	B	.....	6-3½x4½	23.44	Strom...	West.	Bosch.	s-p Own.	Warner.	m Mech.	½F Col.	4.63 R-L-T			
1635	1635	2035c	2155	117	32x4	Rickenbacker	B	.....	6-3½x4½	23.44	Strom...	West.	Bosch.	s-p Own.	Warner.	m Mech.	½F Col.	4.63 R-L-T			
2085	2485	2685	2750c	3285	3585d	128	32x4½	Roamer	6-54-E	Cont.12XD	6-3½x5½	29.40	Strom...	West.	Split.	s-p B&B.	G-L...	f Sneed.	½F Tim	4.60 R-L-R		
3685	3485	3800	3650c	4250p	3950	138	32x4½	Roamer	6-54-E	Cont.12XD	6-3½x5½	29.40	Strom...	West.	Split.	s-p B&B.	G-L...	f Sneed.	½F Tim	4.60 R-L-R		
3785	10000	10000	10950	12800	12850	143½	33x5	Rolls-Royce	40-50	Own.....	6-4½x4½	48.00	Own...	Bijur.	Bosch.	e Own...	Own...	m Own.	F	Own	3.70 R-L-R	
.....	.....	.....	.....	5100	5200	118	32x4	Rubay	.....	Own.....	4-2½x4½	12.10	Strom...	Bosch.	s-p Own.	Own...	m Univ.	F	Own	5.10 R-L-R
1645	1645	2645d	2615	118	33x4	Sayers Six	DP	Cont....8 R	6-3½x4½	27.34	Strom...	Deleo.	Deleo.	s-p B&B.	G-J...	m Arvac.	½F Std.	4.75 R-L-R				
875	875	1315c	1315	108	30x3½	Seneca	L-2 & O-2	4-3½x5	19.50	Zenith	A-L...	A-L...	s-p B&B.	G-L...	m Univ.	F	Peru	4.75 R-L-R				
985	985	1315c	1315	112	31x4	Seneca	50c & 51c	4-3½x5	21.03	Zenith	A-L...	A-L...	s-p B&B.	G-L...	m Univ.	F	Peru	4.50 R-L-R				
2750	2750	2750	2425g	3585	3985	130	32x4½	Stanley	740	2-4 x5	None.	Bijur.	None.	None.	None.	None.	None.	None.	None.	1.50 R-L-R	
310r	348s	285s	580	645	102	30x3	Star	.....	Cont. Spec.	4-3½x4½	15.63	Till...	A-L...	A-L...	s-p Own.	Warner.	m Spicer	½F Tim	4.87 R-L-R		
2250	2250	2450	2275c	3450	125	32x4½	Stearns-Knight	SKL	Own. Kn't	4-3½x5½	22.50	Rayfield	West.	A-K...	m-d Own...	Own...	m Own.	f Ch.	½F Own	4.50 R-L-R		
2700	2700	2700	3350c	3500	14500	130	32x4½	Stearns-Knight	6	Own. Kn't	6-3½x5	27.34	Rayfield	West.	A-K...	u-d Own...	Own...	f Ch.	½F Own	4.90 R-L-R		
1445	1395	1695d	1995	117	32x4	Stephens	10	Own.....	6-3½x4½	25.35	Strom...	Deleo.	Deleo.	s-p B&B.	Mech.	m Mech.	½F Tim	5.10 R-L-T				
2015	1745	2145c	2385	124	33x4½	Stephens	20	Own.....	6-3½x4½	25.35	Strom...	Deleo.	Deleo.	s-p B&B.	Mech.	m Mech.	½F Tim	5.30 R-L-T				
2200	2200	2700	2700	125	32x4½	Sterling-Knight	.....	Own. Kn't	6-3½x4½	25.35	Strom...	West.	m-d	.....	.....	.....	.....	.....	.....	.....
975	995	845g	1225	1550	112	31x4	Studebaker	Light Six	.....	6-3½x4½	23.44	Strom...	Wag-R.	Wag-R.	s-p Own.	Own...	m Own.	f Ther.	½F Own	4.55 R-L-R	
1325	1350	1100g	1975d	2050	119	32x4	Studebaker	Spec'l Six	Own...	6-3½x5	29.40	Strom...	Wag-R.	Wag-R.	s-p Own.	Own...	m Spicer	½F Own	4.33 R-L-R			
1450g	1750	1835d	2550	2750	126	32x4½	Studebaker	Big Six	Own...	6-3½x5	36.04	Ball&B.	Wag-R.	Wag-R.	s-p Own.	Own...	m Spicer	½F Own	3.70 R-L-R			
1995	1995	2315d	2550	120	32x4	Stutz	690	Own. Kn't	6-3½x4½	27.34	Strom...	Remy.	Remy.	s-p B&B.	Warner.	Mech.	½F Tim	4.66 R-L-R				
2450	2790	2640	3490	130	32x4½	Stutz	KLDH	Own...	4-4½x6	30.63	Strom...	Remy.	Remy.	m-d War...	Own...	m Hart.	½F Own	3.75 R-L-R				
1275	1275	p1565c	1305	1895	118	32x4	Velie	58	Own.....	6-3½x4½	24.38	Strom...	West.	A-K...	s-p Dool.	Durston.	m Thie.	½F Own	4.66 R-L-R			
.....	1785	.....	2285	116	32x4	Washington</td															



**No Spitting of Oil
When a Curtis Cuts Out**

There are two sound reasons for this. First: the exclusive and patented controlled splash oiling system prevents an excess of oil from getting into the discharge line. Second: there is no bleeding discharge pipe or intermediate tank. Automatic starting and stopping device governed by means of a centrifugal unloader.

The above illustration is the Curtis Style V Two-stage Outfit—one of the family of popular Curtis Outfits—the last thing in air compressor design—free of complicated parts—built for hard usage and will be on the job all the time. $\frac{1}{4}$ to 3 H. P.—automatic—stationary or portable.

**Single and Two-stage
Many Sizes and Styles**

We manufacture a complete line of single and two-stage outfits. You are sure to find one that will meet your particular needs in style, size and price. Write at once for full information and descriptive literature. Use the coupon below, or a postcard will do.

CURTIS PNEUMATIC MACHINERY CO.
1527 Kienlen Ave. • • • • St. Louis, Mo.

Branch Office: 530H Hudson Terminal, New York City

CURTIS



**CURTIS
PNEUMATIC
MACHINERY CO.**
1527 Kienlen Ave.,
St. Louis, Mo.

Gentlemen: Please send me full details
on Curtis Air Compressors, your proposi-
tion and prices.

Name _____

Address _____

Jobber's Name _____

Address _____



An announcement that will interest all automobile merchandisers regarding models and deliveries of the new six cylinder Sterling-Knight motor car, will be made in the October 18th issue of this magazine.

STERLING-KNIGHT

GATES BELTS

"The Standardized Fan Belt"

More than 100,000 dealers have found it pays to sell the fan belt they can always get instantly from any leading jobber. That's Gates Vulco.

Made by the World's Largest Manufacturers of Fan Belts.

REPU

THEY HAUL
FOOD

THEY
HAUL
ICE

THEY
HAUL
EXPRESS

THEY HAUL
STEEL

THEY
HAUL
OIL

THEY HAUL
ALL THINGS

THEY
HAUL
MEATS

THEY HAUL
FURNITURE

THEY HAUL
PRODUCE

There are more Republic trucks at work today than trucks of any other exclusive commercial car manufacturer. The five models in the Republic line are standing up year after year in all kinds of business, from florist deliveries to granite-hauling.

This wide use of Republic trucks, the completeness of the Republic line, and the resulting trade worth of the Republic name, are significant to every truck dealer. For few makes of trucks can offer the selling power of really national use and national repute.

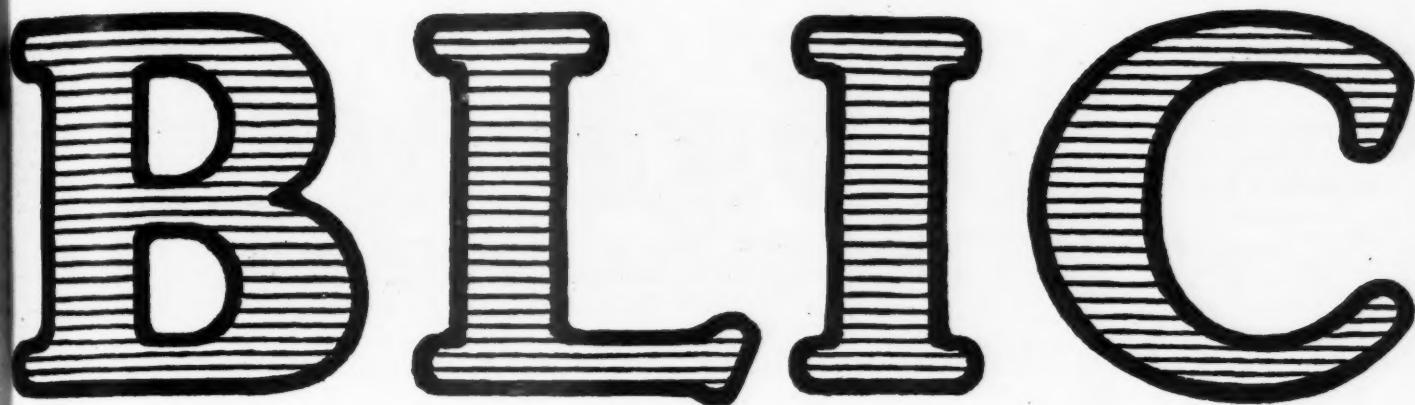
And today there are added values for the holder of a Republic franchise.

There is the virile Republic management,

THEY
HAUL
TEXTILES

THEY
HAUL
GROCERIES

Yellow Chass



THEY HAUL
PEOPLE

THEY HAUL
REFUSE

THEY HAUL
COAL

THEY HAUL
FLOUR

THEY HAUL
RUBBER

THEY
HAUL
BOILERS

THEY
HAUL
STONE

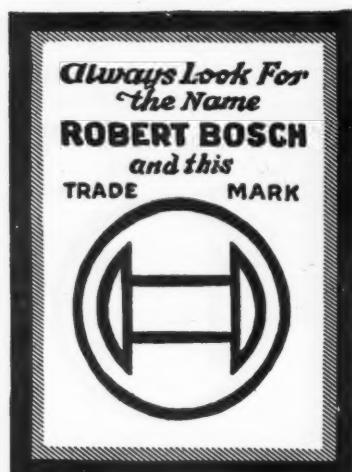
THEY
HAUL
MAIL

THEY
HAUL
BRICK

THEY
HAUL
SALT

THEY
HAUL
PAPER

assis  Trucks



The Robert Bosch Magneto Company, Inc. Wants You to Know

It wants every motorist — every motor boat owner — every jobber, garage owner and dealer in automotive accessories to know:

- 1st That Robert Bosch Products are the *only genuine, original Bosch Products*;
- 2nd That Robert Bosch Products are alone responsible for the good standing of the Bosch Reputation throughout the automotive industry the world over *for more than a generation and today*;
- 3rd That, regarding the sale of the former Bosch Magneto Company; even assuming the legality of the sale, the best that the purchaser of the former Bosch Magneto Company's assets could have secured for himself or others, were inanimate objects — Land, Buildings, Materials, Machinery, Plans, etc. He could not obtain and pass on to others, the inventive genius, the high standards of manufacture, the care and precision in selecting and fabricating materials, the experience, knowledge and ability of the organization responsible for the reputation and performance of the genuine, *original Bosch Products*;
- 4th That we have no connection whatsoever with any other concern of similar sounding name;
- 5th That the quality of genuine, *original Bosch Products* should be judged by products bearing the Robert Bosch name and trade mark—*and by no other*;
- 6th That it is our desire to differentiate as far as is humanly possible—our product and name from that of any other manufacturer in the industry;
- 7th That the energies of this institution are, and have always been, confined to the development and advancement of the automotive industry without being distracted by irrelevant ventures;
- 8th That we stand back of the quality of our product with all of the jealous, wholesouled pride of every honest man in his creation;
- 9th That we regard the interests of the consuming automotive public so highly, that we will do everything in our power to protect these interests against possible dissatisfaction due to the trust placed in the name "Bosch";

Finally we want all to know:—

That by specifying Robert Bosch when purchasing automotive equipment, they are guaranteed securing the absolute satisfaction that has always been assured by genuine, *original Bosch Products*.

And as a further guarantee of the genuine—this trade mark



and the name Robert Bosch are stamped on every product.

Robert Bosch Magneto Co., Inc., 123 West 64th Street, New York

Largest Producers of Quality Automotive Equipment
Otto Heins, President

Chicago Branch: 1302 South Wabash Avenue. Service Stations in Principal Centers the World Over.

Approved

THE NEW
overland
CHAMPION

The First Real
ALL-Purpose Car!

Another Innovation

THE

Overland

CHAMPION

\$695 F.o.b.
Toledo
TRUNK EXTRA



America's Only Versatile Car

AGAIN Overland blazes the trail! The new Overland Champion—an entirely original creation—the first real all-purpose car—the greatest achievement in all Willys-Overland history! Exclusive features, utilities and economies never before built into a motor car. New benefits for motorists. *New and bigger profits for dealers.* Adjustable seats to fit short people, tall people, all people.

Front and rear seats and upholstery *entirely removable* to give large carrying space for samples, luggage, camping duffle—anything! Seats make up into a full-width, full-length bed. Doors *front and rear*. Deep, commodious trunk at rear. *Washable* blue long-grain Spanish upholstery. Body of steel. Powered by the bigger Overland engine. Big power with Overland reliability and economy.

See the Color Spread in October 6th Saturday Evening Post

The Car of 100% Appeal



See the large, square space—50 cubic feet—provided for samples, luggage, etc., by quickly removing rear seat and upholstery.



Please note particularly that front seat adjusts forward to put foot pedals in easy reach of short people. Adjustable to three positions.



Note also that rear seat adjusts backward to give rear seat passengers plenty of room when front seat is moved back.



You will be surprised at the number of packages and the amount of personal luggage accommodated by the big trunk at rear, at small extra price.



Doors both front and rear eliminate climbing over tilted seats and disturbing other passengers when entering and leaving.



Observe the large, comfortable seating capacity of the Overland Champion, and its wide doors both front and rear—no seat climbing.



Here at last is restful sleep on camping trips—both seats and upholstery made into a full length, full width bed in car.



The amount of farm truck, tools, supplies, etc., that can be carried, and the ease with which it loads and unloads through rear door, is amazing.

*Every
Advantage
Is A
Selling Point*

A Veritable Gold Mine For Live Dealers

ONCE more Willys-Overland demonstrates its success in sensing what the public wants, and in fulfilling popular wishes. The world has needed, wanted, looked forward to just such a car as the new Overland Champion. And what is good news to the public is golden news to dealers.

Back of Willys-Overland dealers are not only great resources—but resourcefulness. The cars lead the procession in all the basic appeals of beauty, utility, comfort and economy. Cars that have the complete con-

fidence of the public. Good cars backed by good advertising—vast advertising. In fine, *cars that move!* An *entire line of champions!*

How are sales and profits stacking up with you? Are you steadily going ahead or just holding your own? If you want to insure yourself of permanent prosperity—with bigger-than-average profits in the very beginning, we sincerely believe it will pay you to look into the liberal Willys-Overland dealer proposition. Write or wire—quick—for some plain facts that will interest you.

WILLYS-OVERLAND, INC.

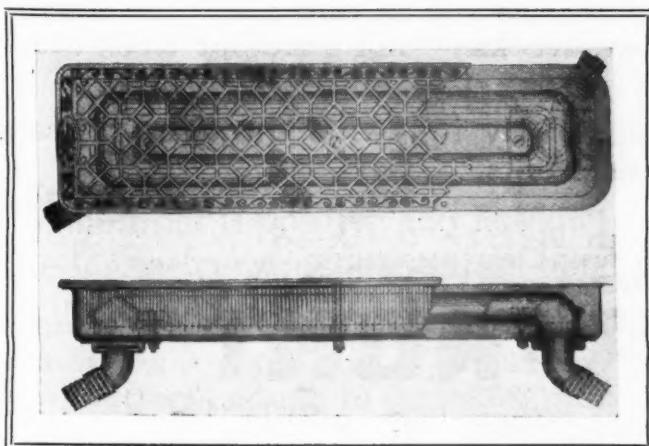
TOLEDO, OHIO

Willys-Overland Ltd., Toronto, Ont.

The logo consists of the word "Overland" written in a flowing, cursive script. The letters are slightly shadowed, giving them a three-dimensional appearance. The logo is centered on the page and is enclosed within a decorative border.



SELL "Fireside Comfort On the Road"



Sectional view of the heating coil and pan with tube connections. The floor cover plate is handsomely finished in polished aluminum and fits flush with the floor. This is the only heater that can be cleaned from the inside of the car. Only one screw need be removed to raise the grating.

It's an ill wind that blows nobody good. The cold winter blasts this winter will bring you sales if you have stocked the Linendoll Exhaust Heater.

The Linendoll installation has won a deserving popularity by reason of the service rendered in making cold weather motoring a pleasure.

The Linendoll Exhaust Heater costs little to install and nothing to maintain. It functions perfectly giving ample radiation, without odor, dust or noise.

The heat is regulated by a dash board control button. This operates a diverting valve attached to the exhaust pipe and the exhaust is conducted through a flexible metal tube to the radiating coil. Complete, and easy to install, profitable to handle.

Ask your jobber or write to us for details.

The Norwalk Auto Parts Co.
Norwalk, Ohio

LINENDOLL EXHAUST HEATER

We ADVERTISE it



Practically every car-owning home in America will be told about the advantages of Winterfront during the next few weeks — not once but week after week, a total of fourteen messages.

This will arouse interest and cause desire. By following through you can turn this desire into orders, which means profits.

Any Motor Will Run Better With A
PINES AUTOMATIC
WINTERFRONT
TRADE MARK REG. U. S. PAT. OFF.

30,000,000 ad-messengers at work

If you went through your Saturday Evening Post of September twenty-second you doubtless saw our message "Put one on my car."

There was another equally strong message in the Post of September twenty-ninth.

Also in the last issue of the American Magazine, on sale September twenty-fifth.

If you pick up this week's Post you will find

another strong advertisement under the caption "Back of your evening's pleasure stands Winterfront."

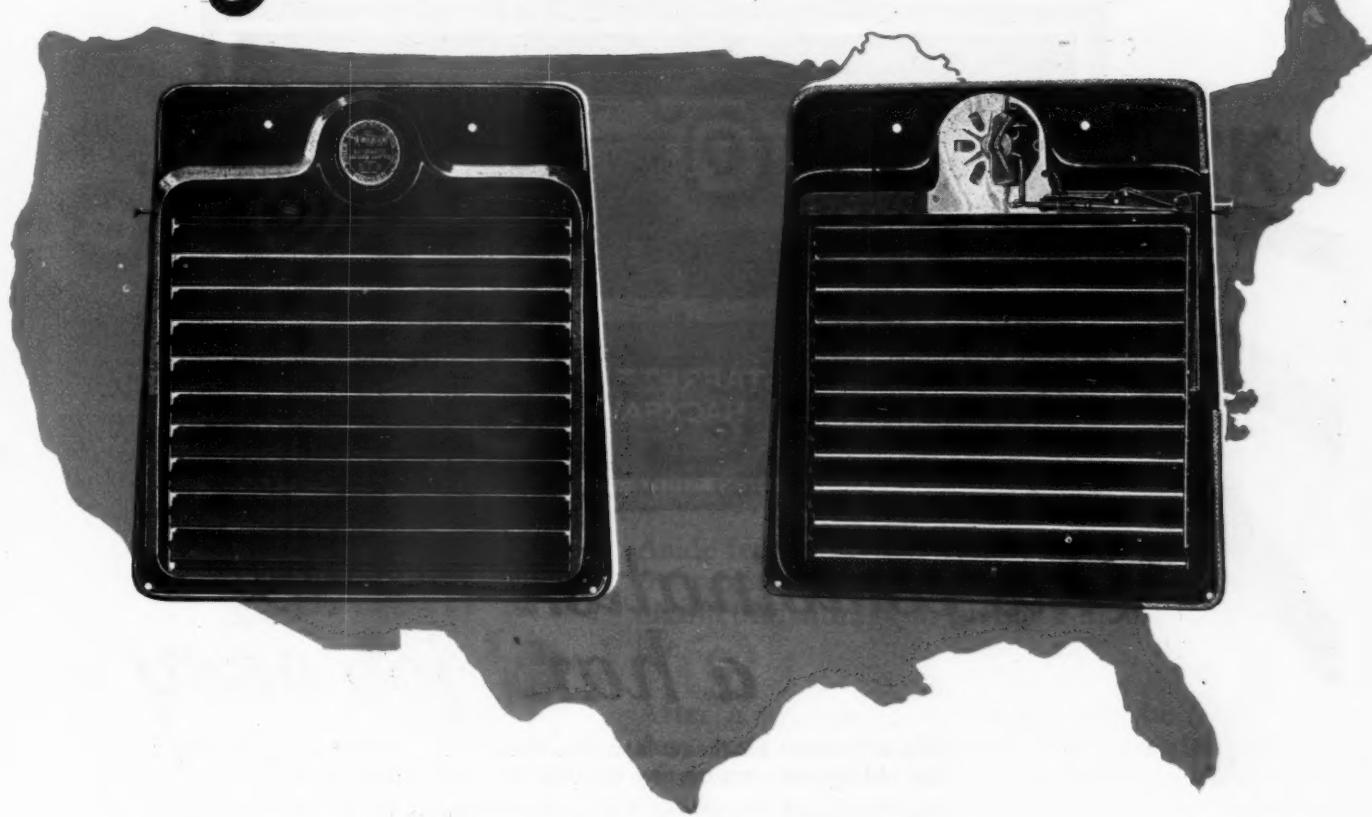
And so on right through the season, if you watch these publications you will see us repeating the message that Winter driving becomes a pleasure when Winterfront is installed.

Remember—liberal profit—no installation expense—no servicing

PINES MFG. CO.

408-410 N. Sacramento Blvd., Chicago

you SELL it



Any Motor Will Run Better With A
 PINES AUTOMATIC

WINTERFRONT
TRADE MARK REG. U. S. PAT. OFF.

Winterfront is positive and automatic because a direct - acting thermostat is used. See construction in right hand picture above.

This is a simple wafer type thermostat loaded with a fluid which expands readily as it warms up. The action has more power than is needed to open the shutters enough to maintain the most efficient operation of the motor.

This thermostat is protected from influence of outside temperature by a wooden cover so that, in effect, it operates as if it were in a thermos bottle. Therefore from one extreme of weather temperature to another the thermostat operates in direct control of the engine temperature without any perceptible outside influence.

Service stations in the principal distributing centers insure quick delivery.

Mail Coupon Today

Winterfront is now obtainable for practically every make of car. Write for name of distributor in your territory and samples of free advertising materials.

Pines Mfg. Co., 408-410 N. Sacramento Blvd., Chicago
 Gentlemen:

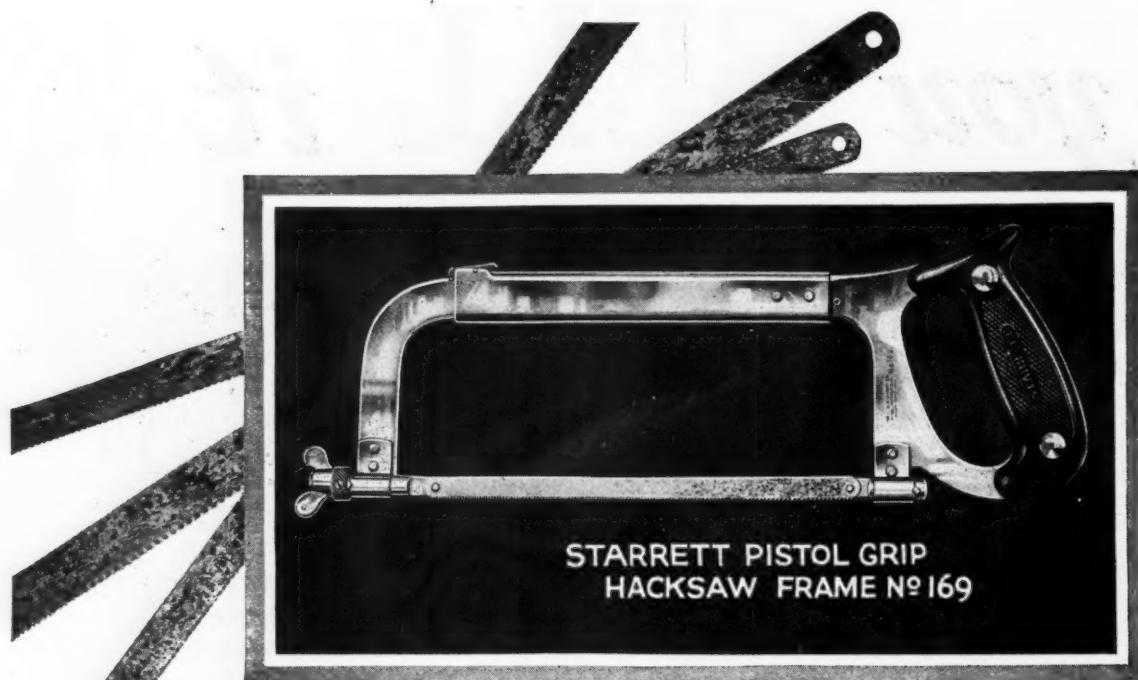
Please send name of Winterfront distributor in this territory. We handle the car.

Name

Signed by

Street

City State



This combination makes a hard job easy -

Slip a Starrett Hacksaw into this Pistol-Grip Frame and you've got the old Indian sign on any cutting job that comes along.

Anything and everything from soft rubber to hard steel—it's positively a revelation to see how clean and fast these splendidly tempered hacksaws go through it.

And with a very minimum of effort, too. All the weight in this new Starrett Frame is back in the Pistol-Grip handle where it will do the most good.

Go into any good hardware store and ask them to show you this husky new frame (No. 169). You've got to get it in your hands before you can really appreciate it. Notice the adjustment on the back that makes it easy to change a blade in no time at all. Any blade from 8 to 12 inches can be used and set to cut in four directions.

It's a Hacksaw Frame any man can be proud to call his own. Stream line design throughout. All steel parts nickel plated. Checked hard rubber handle. Good for a lifetime's hard service. *And*—at a price you can afford to pay.

FREE! "Hacksaws and their Use." A valuable reference book you will be glad to own. Write for it. Also write for Catalog No. 22 "RB" and the Supplement describing the new Starrett Tools.

THE L. S. STARRETT CO.

*The World's Greatest Toolmakers
Manufacturers of Hacksaws Unexcelled*

ATHOL, MASS.

5709



Don't swear every time you pick up a hacksaw. Cut the STARRETT way and forget your troubles. Fewer broken blades—fewer saws getting hopelessly dull on the first few cuts—less elbow grease—it's faster cutting with less effort when the Starrett Combination handles the job.

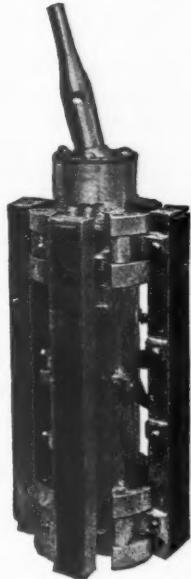
Use Starrett Tools



OK'd
by BUICK



The expansion of the Hall Cylinder Hone is controlled by one spring in the center of the hone body. Each stone receives an equal pressure to an equal distance which prevents an oval worn cylinder from being followed out as would be the case with independent springs behind each stone. Each stone carrier is hinged top and bottom to maintain a rigid parallel. This prevents a tapered cylinder from being followed. All oversizes up to .007" can be taken care of.



After testing under actual service conditions in the New York branch and 7 Canadian branches for over 8 months the Buick engineers have placed their O. K. and approval on "THE HALL CYLINDER HONE." They have recommended it to all their branches.

Aside from the time-saving feature of doing the work right on the chassis, honing has a distinct advantage in giving a motor longer life.

After a certain period of service the cylinders wear oval or tapered but a hardening of the walls takes place to a usual depth of .003".

Grinding or reboring removes most of this seasoned metal and exposes a fresh texture that is subject to rapid wear.

The Hall Cylinder Hone accurately hones off just enough to restore a true cylindrical round with a beautiful hard and polished surface.

Consider the reconditioning jobs that you can now handle with the Hall Cylinder Hone and the profit possible within the flat rates—better, quicker, more profitable work on a \$50 investment.

For sale at all leading jobbers.

THE HALL CYLINDER HONE COMPANY

437 Dorr St., Toledo, Ohio

the seasoned metal is but skin deep—don't waste it

Are You Building for Permanency



Gill Pins

Recently added to the GILL line and already held in high estimation by jobbers, dealers and service men. Whether your business is selling parts or servicing cars you will find GILL Pins a real help in building a permanent business.

GILL Pins are made from solid bar stock and conform to engine manufacturers' design and steel specifications. Grinding limits are .0002" for taper and roundness and .0005" for size.

Carried by jobbers and dealers everywhere and twenty-five GILL branches in principal cities. Write for price list and specification book.



75c



50c

Gill**Special**

30c

Servus

Jobbers, dealers and mechanics merchandising and using GILL Products, identify themselves with GILL Quality, Accuracy and Service.

Gill Interlocking-Joint is the leader in the patented ring field. The specially constructed joint absolutely prevents leakage.

Special Oil-Wiper Piston Ring perfectly controls the distribution of oil on the cylinder walls.

Servus Step-Cut Ring meets the demand for a quality ring of this particular type.

Prices above are up to and including 4".



GILL MANUFACTURING CO.

8300 South Chicago Avenue

Chicago



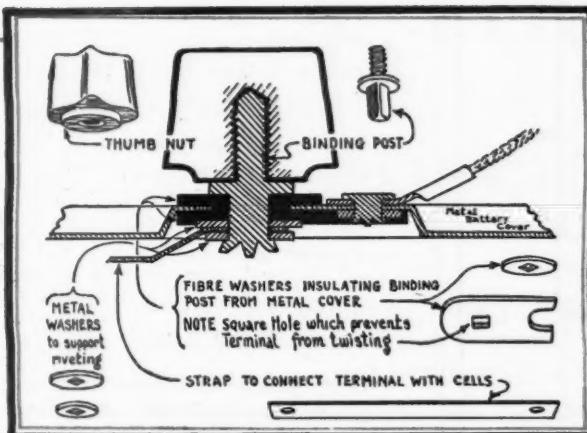
Chapter Two of the Inside Story

"Shucks" said the Sales Manager, "give them the real inside story—tell our friends in the trade about the terminal assembly of Red Seal Sparkers. That's an exclusive talking point that everybody's interested in."

HAVE you ever taken the Red Seal Sparker apart to see how it's made? If you haven't, be sure to read this advertisement for it contains some mighty interesting facts about the insulating and non-turning features of the terminal assembly.

The terminals of the Red Seal Sparker are so designed that *Under no Circumstances* can they *short-circuit, loosen or turn*.

To prevent the binding posts from short-circuiting the cells through the steel container, the hole in the top of the can (through which binding post passes) is considerably larger than the post itself. Over and under the top of the can, yet surrounding the terminal posts, are heavy insulating paraffined fibre washers. These prevent side-sway movements of the posts towards the edges of the holes. The insulated terminals are held in place by pressure of the riveting applied through these fibre pieces. To prevent



twisting of the terminals when the outside thumb-nut is tightened, the lower part of the binding post has a square shank which fits into the square hole in the insulating washer which is under the lid (See illustration above.) The under insulating piece, in its turn, cannot be twisted,

for it fits snugly into the under side of the raised section through which the binding post passes. Only by using *ALL* these different devices in combination in the Red Seal Sparker can we produce such a desirable terminal assembly.

Anyone will find the thumb-nuts of the binding posts on the *Sparker* pleasingly satisfactory. They are purposely made large and shaped to fit the fingers comfortably. That allows one to apply all the necessary pressure for positive connections. And, lastly, on the outside of the can there is imprinted this genuine guarantee:

Red Seal Sparkers are guaranteed to give satisfaction for any use for which a dry battery is qualified.



MANHATTAN
ELECTRICAL SUPPLY CO., INC.

New York

Chicago

St. Louis

San Francisco



PRICES**FORD ARMATURE
REWOUND, \$2.00****ANY TWO UNIT
GENERATOR
ARMATURE
REWOUND
\$5.00****Write for this Booklet**

It contains complete price lists for all classes of work and much valuable information about armature rewinding. Send for a free copy.

BUY ARMATURE REWINDING AS YOU BUY OTHER THINGS

When you buy merchandise to resell you make sure of the quality of the goods. You also like to know that a responsible concern stands back of the products you buy.

Why not do the same thing with armature rewinding? Everything depends upon the quality of the work and certainly it is most important that you deal with a concern that has a reputation for doing business in a high grade way.

For years we have been identified with the armature rewinding business. We have constantly developed our facilities for doing this work until today we have one of the finest equipped plants in the country. Our guaranty on every piece of work indicates our way of doing business. It is well known throughout the automotive trade that we back up this guaranty in each and every case.

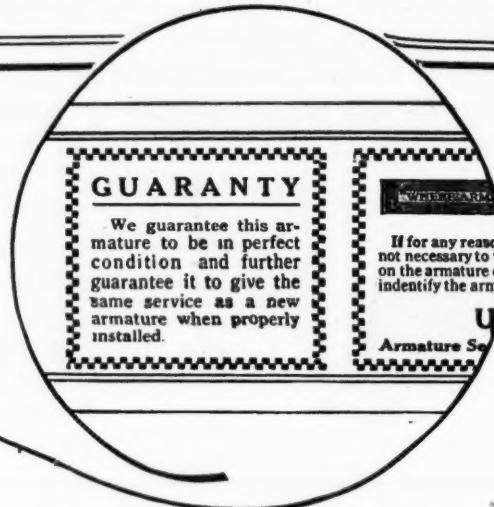
Our stock of rewound armatures for exchange purposes is over 6,000. Armatures for practically all cars are included. We can ship your order the same day we receive the defective units from you.

Ship us your armatures to be rewound — you'll be highly pleased with the quality of the work.

U. S. AUTO SUPPLY CO.

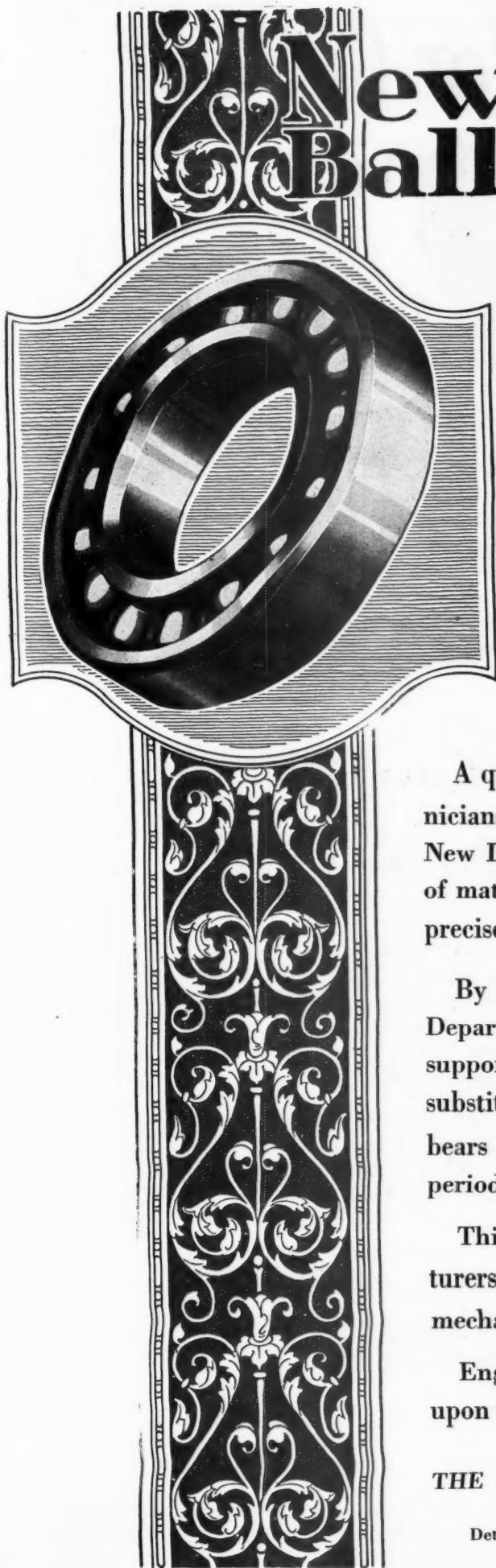
Armature Service Division

3845 S. Wabash Ave., Chicago



**Look For
The Yellow Band
With the Printed Guaranty**





New Departure Ball Bearings

A Triumph of Specialization

THE search for the "Fountain of Youth" is not confined to Ponce De Leon or the Katzen-jammers, nor is the attempt to prolong life as hopeless—especially when applied to the realm of automotive mechanism.

A quarter of a century of concentrated effort by technicians has resulted in the evolution of the perfected New Departure ball bearing—of a principle so correct, of material so enduring and of accuracy of dimension so precise that its maximum life is yet untold.

By successfully resisting wear within itself, the New Departure ball bearing lends greater life to the shafts it supports and the gears it locates. As rolling action is substituted for *sliding* in each successive moving part that bears upon another, just so much longer will be the period of usefulness of that machine.

This is the trend of design just as surely as manufacturers and users urgently desire longer life in their mechanical investment.

Engineering Data Bulletins and consultation service upon request.

THE NEW DEPARTURE MANUFACTURING COMPANY
Bristol, Conn.

Detroit

Chicago

Something for the Car for Christmas



MONOGRAM *The* ORIGINAL Self Locking Radiator Cap

The Practical Gift

People give to be remembered. A practical gift reminds of the giver every time it serves. That makes Monogram Cap an article WANTED for giving. Besides being attractive to look at, and marked by the giver's thoughtfulness, Monogram Cap is a frequent reminder because its service is dependable.

Like Monogram service and co-operation, Monogram Cap has been steadily improved in detail until the room for improvement has vanished. It is more than ever fit to push sales in the profitable field which Monogram pioneered.

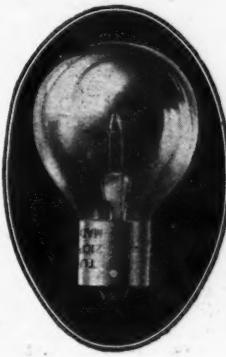
This year's Christmas sales-help will far outdo last year's successful aid. Get your name in early for it.

GENERAL AUTOMOTIVE CORPORATION
600 West Jackson Boulevard
Chicago, Illinois



QUALITY

PROFITS



TUNG-SOL

THE LARGEST INDEPENDENT BULB MANUFACTURERS IN THE INDUSTRY. 16 National distributing points. A Quality line. An interesting sales policy plus *real* profits. These are the fundamental reasons for the constantly increasing popularity of this lamp bulb.

TUNG-SOL is as good as skill, experience and fine materials can produce—a bulb built to last and serve under all conditions. With distributing centers throughout the country, we keep the jobber's and dealer's stock complete at all times. Here is a Quality line, merchandised with a sales proposition that appeals to the progressive business man.

Jobbers, servicemen and dealers will find it advantageous to write for the facts.

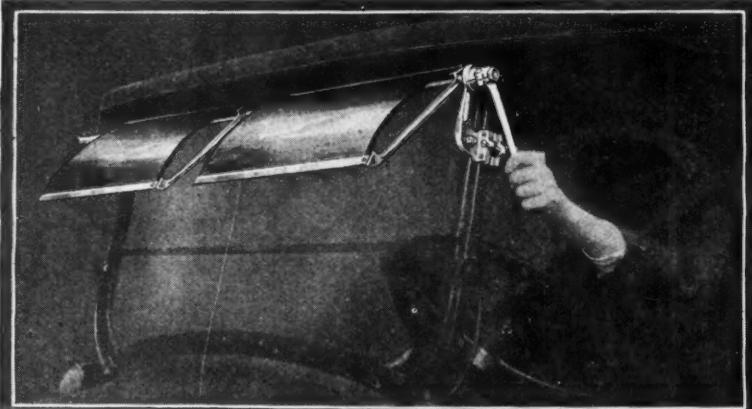
MINIATURE INCANDESCENT LAMP CORPORATION

Newark, New Jersey

Licensed Under General Electric Company's Incandescent Lamp Patents.



*Let TUNG-SOL Light the Way
To Better Lamp Bulb Business*



No other shade has this feature

It is instantly adjusted to any desired shading position with one hand—from the driver's seat.

That's what's got 'em all buying

YOU raise or lower the shade while driving, by a slight push or pull with the left hand.

Makes Night Driving Safe

Driver simply reaches up and pulls lever—lowering shade and subduing headlight glare of on-coming car. The shade is as easily raised when the blinding headlight has passed.

Eclipse Safety Driving Shade sold the moment it was put on the market. Dealers are already sending big repeat orders.

Fits any car. Made in two grades, \$12.00 and \$20.00, beautifully finished—three colors—amber, blue and green. Transparent material cannot warp, sag or buckle. Shade always retains its shape. Improved edge binding methods make this possible. Almost all parts are entirely of aluminum. Non-corroding and rust-proof. Neat, trim—an ornament to any car and made for *all* cars.

Another big feature: You stock only *one* size for *all* cars.

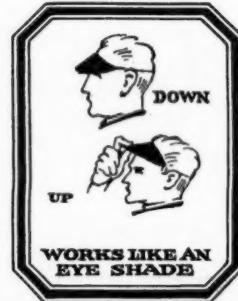
Get in on the profits now. Ask your Jobber or write us direct—at once.

Eclipse Safety Driving Shade is a whale of a seller. Get busy today.

SUBURBAN TRANSIT COMPANY, PLAINFIELD, N. J.

Subsidiary of Spicer Mfg. Co.

ECLIPSE
SAFETY DRIVING
SHADE



Warford

AUXILIARY TRANSMISSION

The Warford Selective Gear Transmission makes the Ford not merely an ordinary 2-ton truck, but a capable, burly job, more than able to hold its own under full 2 tons in any going. In the mud and sand of excavations or country roads Warford underdrive **OUTPULLS amazingly. On smooth roads or running empty Warford silent **OVERDRIVE** lets the engine take it easy at high road speeds. Warford six speeds forward meet all truck conditions better. Several times the price buys no more real ability than Ford plus Warford. The biggest thing dealers have had for years. Write to us.**

The Warford Corporation
44 Whitehall Street, New York



AUBURN, N. Y.
Foster-Warford Co.

CANTON, Ohio
Dine-De Wees Company
400 Walnut Ave., S. E.

DALLAS
Houdaille-Polk Co.
2218 Commerce St.

DAVENPORT, Iowa
Sieg Company

DENVER, Motor
Specialties Company
17 W. 13th Avenue

MEMPHIS
Continental Body Co.
476 Union Ave.

MINNEAPOLIS
McGee White Corporation
1311 Hennepin Ave.

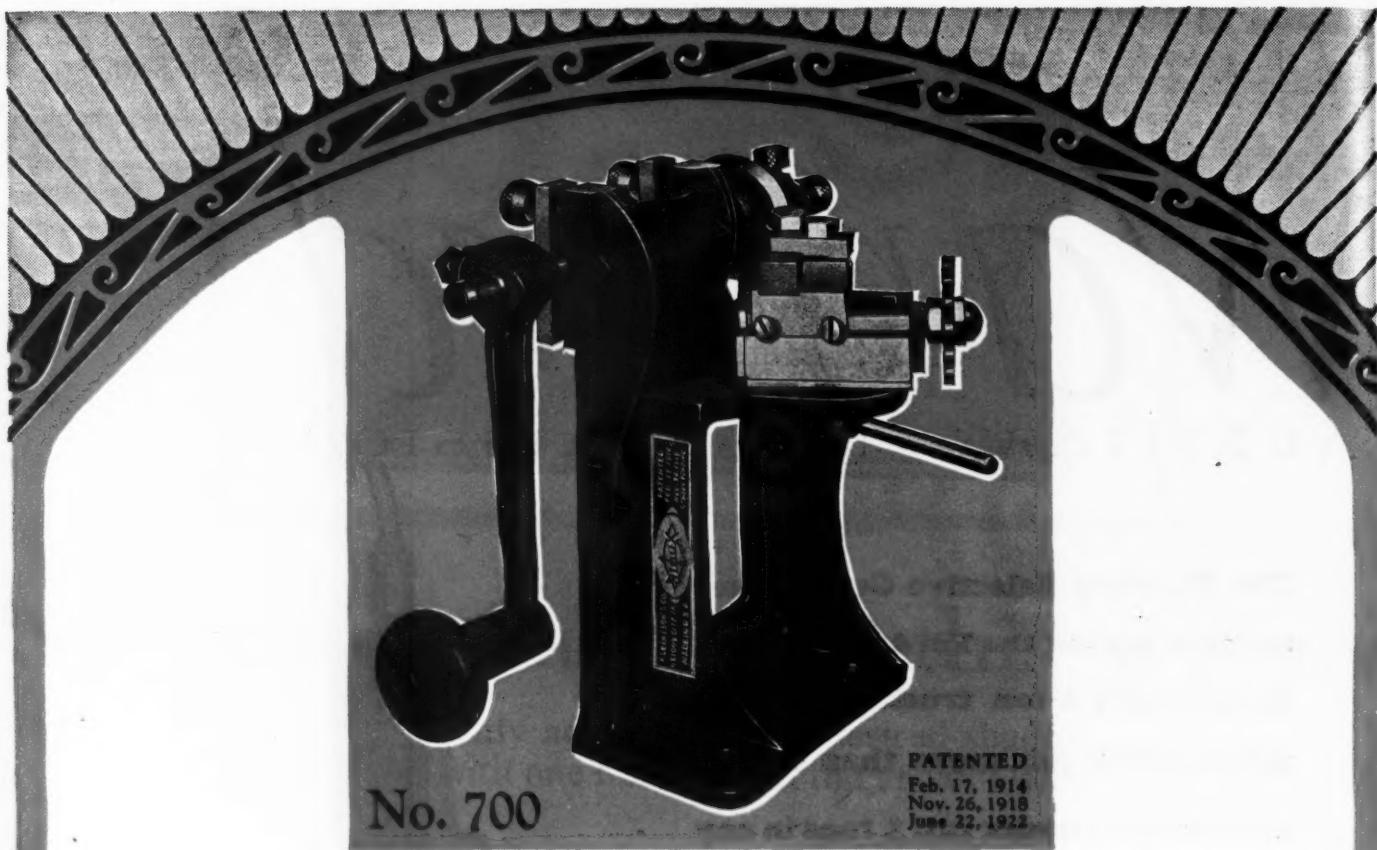
NEW YORK
Motive Parts Corporation
796 10th Ave.

SAN FRANCISCO
Warford-Pacific Co.
1111 Post Street

STOCKBRIDGE, Mich.
Transmission Sales Co.

VANCOUVER, B. C.
E. W. Jay

WICHITA, Kans.
Price Auto Service Co.
301 S. Topeka Ave.



Little Sioux Valve Lathe

Give your shop a square deal by equipping it with reliable and accurate tools. Good tools will pay 100% dividends.

The "Little Sioux" Valve Lathe fills a need in every shop. Refaces valves up to 2½ inches, either 30, 45 or 60 degree angles. Is simple, self-adjusting and absolutely Accurate. Investigate "Sioux" Tools and learn why they build business and insure greater shop profits.

Sold by All Live Jobbers

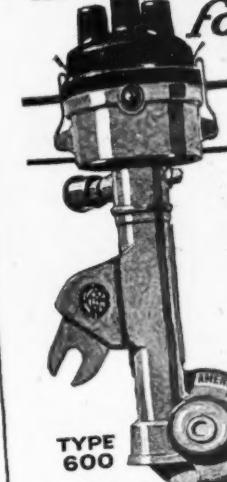
Write for Catalogue and Valve Seat Reamer Specifications
ALBERTSON & CO. SIOUX CITY, IOWA



Millions of Ford Owners Are Reading These Big Ads

THE SATURDAY EVENING POST

The New— **BOSCH** HIGH TENSION IGNITION SYSTEM for FORDS



OK'd by over Seventy Thousand
Ford Owners the last 4 mos.

Here's the biggest value ever offered Ford owners! Type 600 is a wonderful new Ignition System—big, dependable, efficient, waterproof—

It is not just a Timer—but a complete ignition system built especially for Fords by the makers of the world-famous Bosch Magneto—

It makes a wonderful improvement in Fords—insures quick, easy starts, more power on the hills, smooth running under all conditions.

Throttle her down in traffic and she'll run slowly without "bucking." Give her the gas and she'll dart away, far ahead of the rest.

Has automatic spark advance—keeps plugs clean.

You get your money back in thirty days if you're not satisfied.

\$12⁷⁵
AND TAX

AMERICAN BOSCH MAGNETO CORP.
Springfield, Mass. Date _____
Box P-623
Gentlemen: Tell me about your Type 600 Ignition System, and all about your Special Trial Offer.
Name _____
City _____ Date _____ Year of Car _____
Has it a Bosch Motor? _____
Accessory Dealer's Name _____
Dealer's Address _____

**Send this Coupon for
Special Trial Offer**

MY CRYSTAL BALL

THE SATURDAY EVENING POST

The New— **BOSCH** High Tension Ignition for FORDS



Quality Ignition Applied to Fords

Here's the biggest value ever offered Ford owners! Type 600 is a wonderful new Ignition System—big, dependable, efficient, waterproof—

It is not just a Timer—but a complete ignition system built especially for Fords by the makers of the world-famous Bosch Magneto—

It makes a wonderful improvement in Fords—insures quick, easy starts, more power on the hills, smooth running under all conditions.

Throttle her down in traffic and she'll run slowly without "bucking." Give her the gas and she'll dart away, far ahead of the rest.

Has automatic spark advance—keeps plugs clean.

You get your money back in thirty days if you're not satisfied.

\$12⁷⁵
AND TAX

Sand Coupon for Special Trial Offer
AMERICAN BOSCH MAGNETO CORP.
Springfield, Mass. Date _____
Box P-623
Gentlemen: Tell me about your Type 600 Ignition System, and all about your Special Trial Offer.
Name _____
City _____ Date _____ Year of Car _____
Has it a Bosch Motor? _____
Accessory Dealer's Name _____
Dealer's Address _____

in the
Saturday Eve. Post
Literary Digest
and other nationals

“Cash-in” NOW—Ask’em to Buy

A big advertising campaign on the wonderful new Bosch-Ford Ignition System is now in progress.

Millions of Ford owners are being reached through large ads in the Saturday Evening Post and other prominent nationals. Tremendous interest is being shown—thousands of inquiries are pouring in, and dealers are reporting phenomenal sales.

Tell the Ford Owners in your town that YOU sell the Bosch Type 600 System. Lay in a good stock, put in a window display—take full advantage of Bosch Advertising.

Don't let your competitor beat you to it. Be quick—while the big drive is on!

Wire—or mail the coupon TODAY.

Mail This Coupon TODAY

AMERICAN BOSCH MAGNETO CORPORATION

Springfield, Mass.

17 W. 86th St. 5810 Woodward Ave. 3737 Michigan Ave. 1262 Post St.
New York Detroit, Mich. Chicago, Ill. San Francisco, Cal.
 Send me a Bosch Type 600 System at dealer's price C. O. D.
 Send me your dealer's proposition on the Bosch Type 600 System,
also list of your distributors.

Firm Name _____

Street Address _____

City _____ State _____

Date _____ Signature _____

The AERMORE Exhaust Horn

Everyone respects this courteous, effective signal. May be heard for a mile or more yet does not frighten or confuse. Helps avoid accidents. Gets the right of way with a smile. Operates by exhaust gas. Easily attached. Outlasts the car.



Satisfaction
Guaranteed

Prices

With Valve and Fulton Hand Control

No. 00—22 in. long, Motor Bus Special	\$14.00
No. 0—17 in. long, for large autos, trucks	12.00
No. 1—15 in. long, for medium cars	10.00
Ford Special	7.00

Give name of car and outside diameter of exhaust pipe.

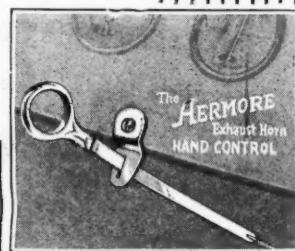
DEALERS: Demonstration stand free with order of ten or more Aermares, one or assorted sizes.

Prepare for an Automotive Christmas



The AERMORE VALVE

A part of every Aermore Horn outfit, also sold separately for exhaust heaters. Self-closing. For exhaust pipe $1\frac{1}{2}$ to 3 in. \$1.80. For exhaust pipe $3\frac{1}{2}$ to $4\frac{1}{2}$ 3.50



Shellerite



The Fulton Shellerite Steering Wheel

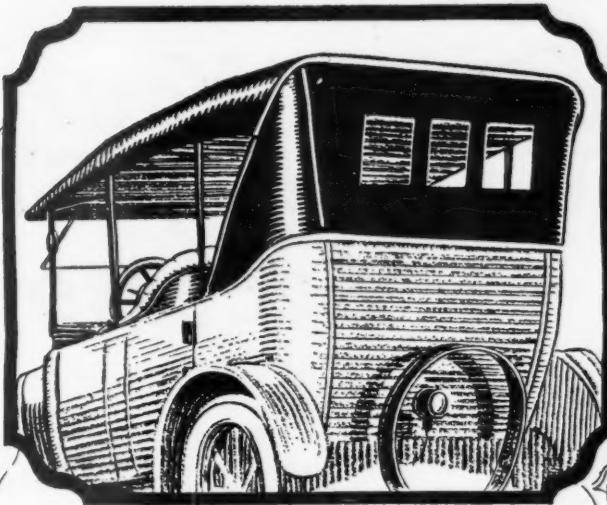
Adds to the comfort of driving. Dresses up a car. Will not crack or fade. Made of composition hard rubber. Standard equipment on a number of high-priced cars. Aluminum spider inserted in rim. Beaded top corrugated with outside hand grip. Diameter of wheel 17 inches. For Chevrolet, Star, Dodge, Maxwell, or Overland Cars \$6.00. For Fords 5.50

Ask your Dealer. Dealer, write Jobber or us.

Manufactured by

The Fulton Company
Dept. 15-F, Milwaukee, Wisconsin

Two Ways Rose Top Covers Make Money for YOU



A Double-Barreled Profit Item

Adds \$25 to the Sale Value of any used Ford

PROFIT No. 1—An ever increasing number of Ford Touring and Roadster owners are buying Rose Top Covers to replace their old ones when they get shabby. The improvement in appearance is remarkable—and the cost is only \$9.00.

PROFIT No. 2—Never try to sell a Ford with a saggy, faded top. A new Rose Cover will increase the value \$25 or more. And that's a big profit.

Most jobbers can supply you. If yours cannot, write us direct.

FRANK ROSE MFG. CO., Hastings, Nebr.

Consumer Demand has more than doubled

ROSE TOP COVERS



Here's Your Fastest Selling Winter/ Accessory!

The KINGSTON CAR HEATER will be your best seller this fall. A stock of these heaters will mean ready sales, a handsome profit and a host of pleased customers. This is a quality heater, an ornament to the car, selling at popular prices — a heater that has genuine "heatability." *It is a heater you can fully and freely endorse.*

Kingston Heater Advertising

Reproduced herewith in miniature is a full page in the Saturday Evening Post. This is to be followed by a number of smaller (one-fourth page) advertisements strongly urging the *Heater* as an ideal Christmas present. This vigorous consumer campaign will mean quick profits to dealers. Stock the complete line and be ready for the certain demand. Be sure that you get a complete supply of window displays, counter cards, circulars and other dealer aids.

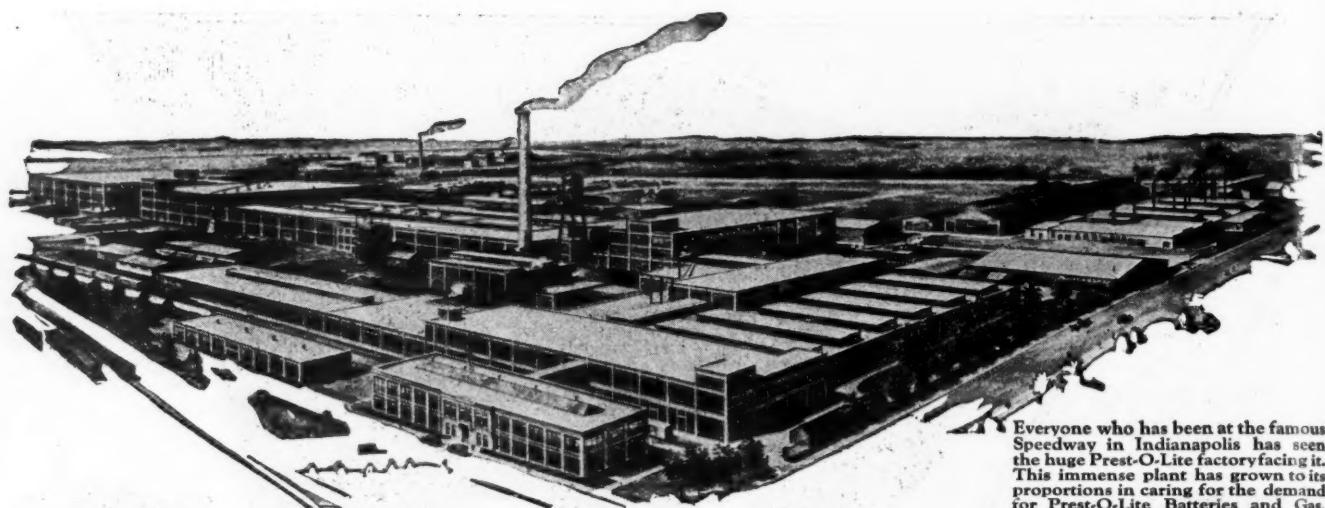
Kingston Heaters have hosts of friends. Sales have more than doubled every year. Get your share of this good business.

A Heater with real "heatability"

Kokomo Electric Company

KINGSTON

CAR HEATERS



Everyone who has been at the famous Speedway in Indianapolis has seen the huge Prest-O-Lite factory facing it. This immense plant has grown to its proportions in caring for the demand for Prest-O-Lite Batteries and Gas.

Concerning Character and Reputation

The character of an institution is what it really is. The reputation of that institution is what the public believes it is. In the long run character and reputation become one and the same thing, for no man nor institution can for long enjoy a good reputation built on a bad character.

Starting in the early days of the automobile this organization began to serve motorists. It has served motorists ever since. We are proud of having furnished the oldest service known to motorists, because of the character of that service. A great organization has developed since we started to serve motorists, but the ideal, the character of that service has remained constant.

Today motorists depend upon Prest-O-Lite Batteries for starting and lighting just as in the early days they depended upon Prest-O-Lite gas for lighting. And to this very day the most efficient and economical truck lighting is furnished by Prest-O-Lite gas.

What serves best is the idea behind Prest-O-Lite gas. Today it means Prest-O-Lite batteries for automobiles—Prest-O-Lite gas for trucks. Ten years from now who knows what changes will come. But whatever comes Prest-O-Lite service will be in the forefront. That is the character and the reputation of Prest-O-Lite.

THE PREST-O-LITE COMPANY, Inc.
Indianapolis, Indiana

New York Office: 30 East 42nd Street
Pacific Coast Office: 599 Eighth Street, San Francisco
In Canada: Prest-O-Lite Company of Canada, Ltd., Toronto

Dealer Note:

If there is no Prest-O-Lite distributor in your city you can buy direct from our factory at factory prices. Write us.



**"THE
OLDEST SERVICE
TO MOTORISTS"**



Double-acting thrust bearing, flat seats (grooved races) 2100-F Series



Single-acting thrust bearing, flat seats (grooved races) 1100-F Series



Single-acting, self-aligning thrust bearing 1100 Series



Single-acting, self-aligning thrust bearing, leveling washer. 1100-U Series



Double-acting, self-aligning thrust bearing, leveling washers 2100-U Series

Ask Our Engineers

They can solve your problems

The experience of our engineers covers every type of ball bearing installation ever designed.

Vast files of data, huge stores of information are at their command. And clients of ours are entitled to the technical advice of our experts.

Strom Service means perfect service.

Quick deliveries; the highest grade of product; a keen interest in the successful performance of every bearing throughout its life.

Our surplus is your reserve. Vast resources of engineering knowledge; skilled engineers who will design your installations.

Constant experimental work looking to new and more efficient uses of ball bearings, simpler and more practical methods of reducing friction.

Even if you are not a client of ours, we will be glad to have you put your problems up to our staff of consulting engineers. There is no obligation. Just drop us a line.

Strom

BALL BEARINGS

Production is sped by the reduction of friction

U. S. BALL BEARING MFG. CO.
4551 Palmer Street, Chicago, Ill.



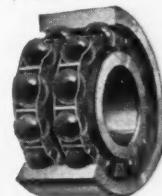
Single-row deep-groove Standard type, radial bearing



Double-row, deep-groove Standard type, radial bearing



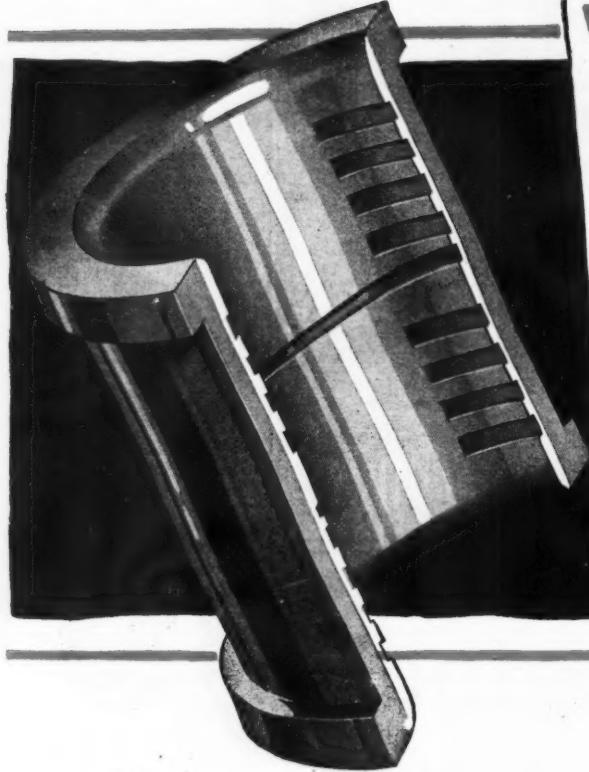
Angular contact bearing, combination radial and thrust



Double-row, maximum type, radial bearing



Single-row, maximum type, radial bearing



- ✓ **Solid Bronze Backs**
- where bronze backs are used
- ✓ **100% Virgin Metal**
- ✓ **10 Times Tested**
in inspection
- ✓ **Clean, Solid Babbitt**
- no Blow Holes
- ✓ **Machine Finished**
both before and
after babbetting
- ✓ **Not Over**
a Day Away



"That's Why I Use Them!"

BECAUSE I can get Milwaukee Bearings when I need 'em — and when I get 'em they're right!

"Sure, I'm a crank—proud of it! Do you wonder I'm particular about bearings? Listen! Every time the gas takes a poke at a piston it gives a 2000 pound smash.

"Bearings made like Milwaukee's are bound to be right. They stay put.

"I'm a nut about service, too. Dog-gone it, you can't blame a man for squawking when his car is tied up a week or so. I like to get 'em out of the way quick. And Milwaukee Bearings help me do it. That's why I use them!"

MILWAUKEE DIE CASTING CO., Milwaukee, Wis.



A network of over 400 Milwaukee Bearing distributors insures you of service "not over a day away"—no matter where your shop is located.



Write Today for this Bearing Guide

It's easy to order from this handy Milwaukee booklet giving car, truck and tractor list, with bearing stock numbers for each. May we send it to you, with the name of our nearest distributor?

MILWAUKEE  **BEARINGS**

The BiG Arvin Campaign in THE SATURDAY EVENING POST

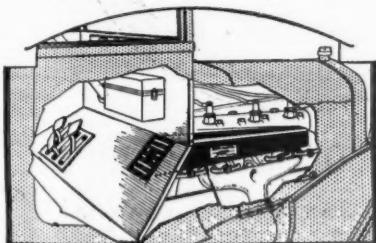
will sell Heaters for you!

THE steady, forceful advertising campaign in *THE SATURDAY EVENING POST* is selling Arvin Heaters De Luxe for dealers all over the country. Make it work for you!

Most of the car owners in your territory are reading these advertisements and are wondering where they can get so much personal driving comfort for so little! Tell them to come to your place!

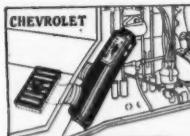
With three out of every four cars live prospects for this year-round convenience, there's no reason in the world why you shouldn't be making a killing!

Tie up with the year's biggest heater campaign now—order a case of Arvins direct, specifying jobber. We'll slip in a liberal supply of snappy folders, hangers, etc., and deliver in a hurry.

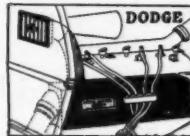


West of Denver
\$1.90
In Canada
\$2.50

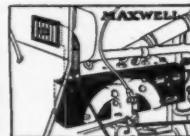
FORD TYPE \$1.75



CHEVROLET \$3.00
West of Denver \$3.50
In Canada - \$4.50



DODGE - \$5.00
West of Denver \$5.50
In Canada - \$7.50



MAXWELL - \$5.00
West of Denver \$5.50
In Canada - \$7.50

ARMIN-HEATER

DE LUXE
Products
for the Motorist's Comfort

Patents Dec. 19, 1916
Dec. 5, 1922

INDIANAPOLIS PUMP & TUBE CO.
1020 Drover Street - - - INDIANAPOLIS

KINGSTON

The KINGSTON line for 1923 embraces not only the best but the handsomest carburetors that the world's largest carburetor factory has been able to produce in the quarter century of its existence. All of the Kingston De Luxe line carburetors are of brass construction, all are equipped with Kingston Steering Column Control, and with the new type compact brass fuel strainer. They are attractively boxed in special counter display cases in sets of three, and there is a big established demand awaiting the alert dealer. Write for particulars.

THE NEW FORD MODEL

The new all-brass Kingston for Fords, equipped with Steering Column Control and fuel strainer, is one of the big sellers of the season. Not only is the new model made of highly polished brass, but it is finished with utmost care in every detail. Thus the best Ford carburetor on the market becomes also the handsomest on the market. This model, with Steering Column Control attached, is shown in the illustration to the right.

Kingston De Luxe Models are made also for Maxwell, Chevrolet, Overland, Dort and Dodge at \$15; for Studebaker at \$16.50, Haynes at \$20.00, and many other popular priced car models are furnished.

The Kingston line can be had in special display boxes, three to the box, in any combination the dealer desires. Vigorous advertising co-operation is at the command of the dealer. Get in touch with us at once.

BYRNE, KINGSTON & COMPANY
KOKOMO, INDIANA

New York, 245 W. 55th St.
Detroit, 4610 Woodward Ave.

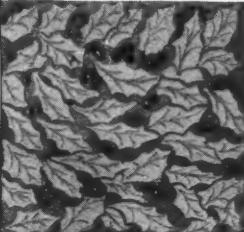
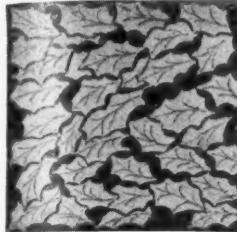
BRANCHES
Los Angeles, Cal.,
1417 West Pico St.

Chicago, 1430 Michigan Ave.
Dallas, 2218 S. Harwood St.



STEERING COLUMN CONTROL

The Kingston Steering Column Control, shown attached to the Ford De Luxe Model in the illustration above, is not a choke, but operates directly in connection with the needle valve, with a pull button operating through flexible steel tubing. The pull button is attached to the steering column just below the wheel, handy to the driver. It affords a full 90 degree operation of the needle valve, either for starting or in extreme road or weather conditions, is a splendid all the year around convenience, and saves time, temper, and fuel and motor wear. It is very easily installed, is a part of every De Luxe Kingston, and is a boon to the driver.



Get extra Christmas trade with the CRESCENT KIT

This new display carton on your counter tells its own story. Six Crescent Kits—and six easy sales to holiday shoppers in search of something new. Three Crescent tools, wrench, pliers, screwdriver—the ones that every man wants — packed in a holly box that makes the outfit doubly attractive. And if you have any left after Christmas, the holly paper comes off leaving the plain package for regular trade. Your customers will look for the Crescent Kit because it is

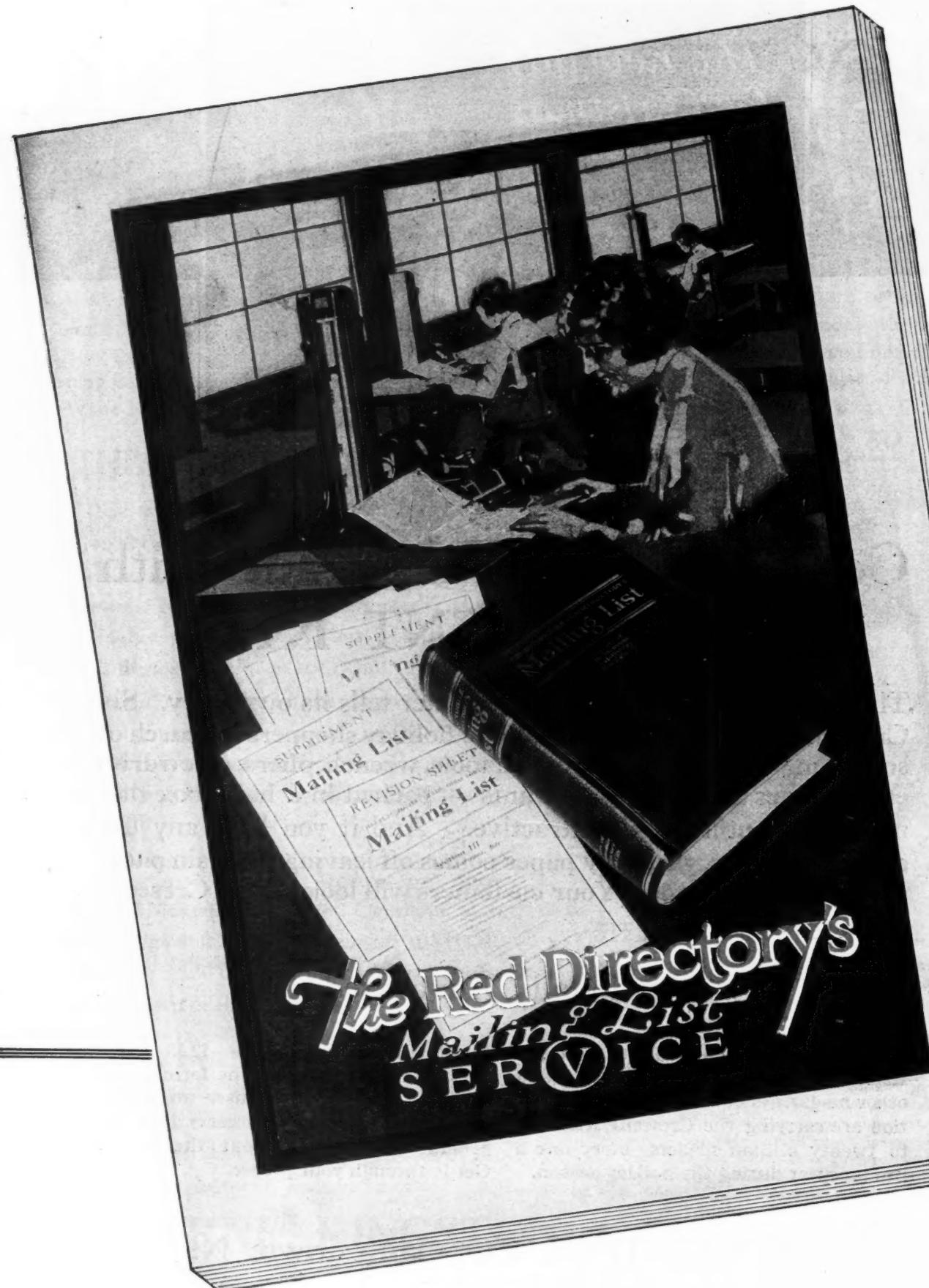
Nationally Advertised

The Saturday Evening Post, Pictorial Review, Popular Mechanics, Motor, and other magazines of country-wide circulation are carrying the Crescent Kit story to twenty million readers—every one a live prospect during the holiday season.

It sells at a popular price—\$2.35 retail. Appeals to the motorist, the farmer, the radio fan, or any tool user anywhere. Fits the side pocket of a car. Fine for general "tinkering" about the house. Get it through your jobber.

CRESCENT TOOL CO., Jamestown, N. Y.
"The CRESCENT WRENCH people"





The Original

Eliminate Waste in Selling—

PROBABLY more money is wasted in selling effort in the automotive field than in any other industry and the chief cause is the faulty prospect list. Changes in the automotive industry occur with astonishing frequency and the ordinary prospect list gathers dead wood just that fast.

Despite the greatest care and intelligent work in the original compilation of a list of the automotive trade it takes very little time for it to become inaccurate and burdened with thousands of names that are worse than useless. Concerns fail, pass out of existence, move, lose their identities in consolidations, change dealerships, lines of business, etc., etc.

The changes in this field establish a bottomless pit for salesmen's time and your good advertising money if you do not use a list that keeps pace with them.

Figure how much money you spend on an average for each name and then estimate your outright loss in circularizing one hundred, one thousand or more "dead" names and don't confine "dead" only to those that are returned by the Post Office.

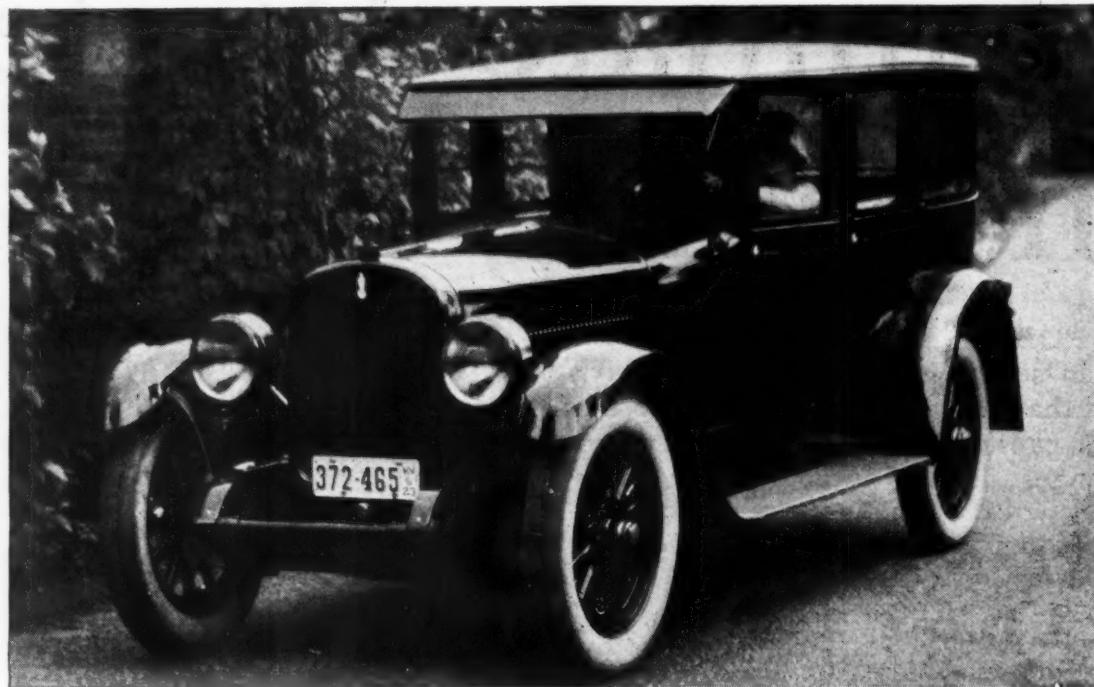
No precaution with which you can surround your mailing matter such as return address—even registration—can insure the return of mail matter addressed to individuals or concerns who have ceased to be active in the industry, for the Post Office usually is provided with addresses where mail can be forwarded. The Post Office concerns itself principally with the delivery of mail, incidentally with the return of it and not at all with the integrity of mailing lists. Uncle Sam's success in delivering mail to concerns that have moved or changed their names and to individuals who for years have not been with firms in whose care they are addressed is almost super-human. In fact were all of this matter returned to the senders as undeliverable the question "Why don't we get more returns from our direct-mail-advertising?" would be answered.

It is an absolutely fixed rule of business that the effectiveness of selling effort through the mails or salesmen is entirely dependent on the completeness, accuracy and purchasing power of the list of prospects.

If you are interested in up-to-date lists of dealers, garages, repair shops, supply stores, wholesalers and jobbers, tell us about your requirements and we shall be glad to explain our service to you.

The Automobile Trade Directory
239 West 39th Street, New York, N. Y.
A Class Journal Publication.

*The Automobile Trade
"The RED" Directory
Directory of the Automotive Industries*



For 80 Years

For more than the lifetime of most of us—the J. I. Case T. M. Company has operated a growing business, at a profit.

Today its capitalization is \$40,000,000, its plant is valued at \$15,000,000, and its business last year from products sold here and abroad ran into many millions.

The J. I. Case T. M. Company has been known to bankers longer and better than almost than any other automotive manufacturer.

Case has been the mark of mechanical excellence for more than eighty years. Dealers and distributors know what that is worth.

Do you?

J. I. CASE T. M. COMPANY, RACINE, WISCONSIN



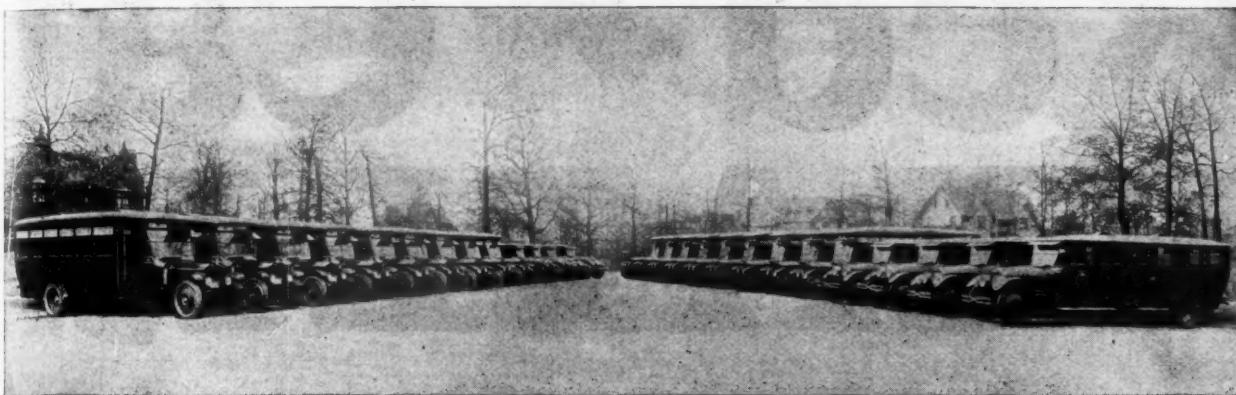
CASE
MOTOR CARS



THE SIGN OF MECHANICAL EXCELLENCE



FOR MORE THAN EIGHTY YEARS



*This splendid fleet of motor busses in the service of the Pennsylvania-Ohio Electric Company
is equipped with "Perfection" bus springs*

Not Price—but Service



THE margins on which springs are bought today are very close, and a few cents' difference in price may count heavily. Fully conscious of that fact as we are, we will not lower our standards to cut off those few cents. Springs are too important a unit in a car or truck to be built on price alone. If you want good springs, look for "Perfection." They are built for long and strenuous service.

The EATON AXLE & SPRING COMPANY
PERFECTION SPRING DIVISION
CLEVELAND

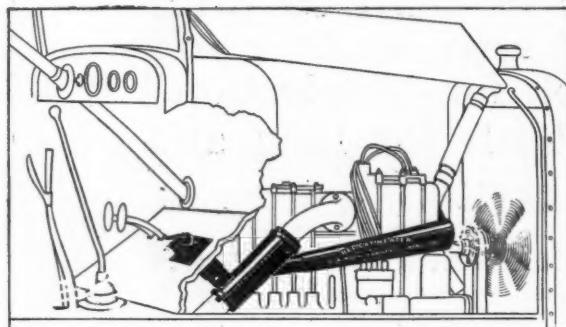
PERFECTION SPRINGS

An EATON  PRODUCT

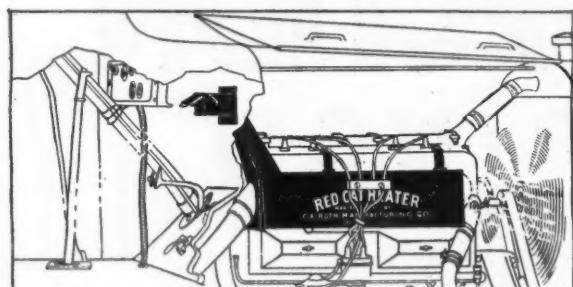
Red Cat HEATERS



Ford
\$1.50



Chevrolet \$4.00



Dodge \$5.00

Stock Up for Heater Season GET THE BIG EARLY-SEASON PROFITS

Heater season opens with a bang the first cold day. Business is lively from then on. Be ready! Order your Red Cat stock at once.

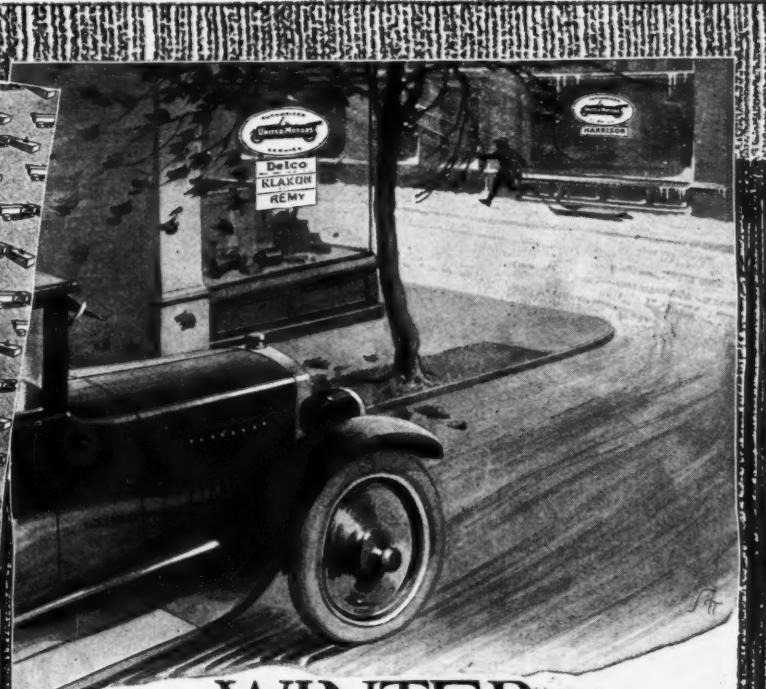
For profit and service you can't beat the Red Cat line. Popular prices. Guaranteed quality. Positive heat flow. Easy heat control. Warms the floor first. Maintains 70° of comfortable, healthy temperature in zero weather. Every Red Cat feature is a sales stimulator.

No other heater offers you such unusual opportunity for big, quick profits this winter.

ORDER FROM YOUR JOBBER AT ONCE

Be ready for the season with plenty of the right merchandise. Profit by the big rush of early business. Order Red Cat Heaters from your jobber today.

G. A. ROTH MFG. CO., Hastings, Neb.



500 times I factory

Delco
STARTING - LIGHTING - IGNITION

THE DAYTON ENGINEERING LABORATORIES CO.
DAYTON, OHIO, U. S. A.

THE Authorized Electrical Service Stations of United Motors are backed by the prestige and publicity of Delco and Remy, as well as the consistent national advertising of United Motors. A United Motors franchise is a valuable one. An opportunity may be open in your town. Write us.

UNITED MOTORS SERVICE INCORPORATED
General Offices Detroit, Michigan

REMY

REMY ignition coils are simple to serve if you use the genuine units built especially for the purpose. They come packed in sets of six with each coil in a separate carton. An assortment of adapter brackets and a complete car application list are included with each set. Model 284-K coil with the proper adapter bracket enables you to service over ninety-five percent of all Remy coils in use today. You can obtain genuine Remy service coils through the Branches and Authorized Service Stations of United Motors Service, Incorporated.

REMY
STARTING LIGHTING IGNITION SYSTEMS
REMY ELECTRIC COMPANY ANDERSON, INDIANA

WINTER just around the corner

- See the United Motors Man Now

Have you anticipated the added strains that short, cold days and long, cold nights are bound to place upon the electrical equipment and the radiator of your car?

Resolve today that you will not have starting and lighting troubles *this* winter. Go to the United Motors Authorized Service Station in your town and have your Delco or Remy electrical system inspected and adjusted for winter driving.

Be sure, too, that the radiator on your car is neither clogged nor leaky. Get it ready now for freezing weather. Go to the Harrison Radiator Service Station in your town.

In all cases look for the familiar United Motors oval sign—the sign of expert service and genuine parts.

Winter is just around the corner. Drive into it with starter, lights and radiator in the condition which winter needs demand.

United Motors Service
is the official service organization for the eight well-known products whose names appear on this sign.

The oval sign, in combination with one or more of these trade names, is your assurance of expert factory service. Authorized United Motors Service Stations are required to have special tools and testing apparatus, highly skilled workmen, and complete stocks of genuine parts.

These facilities together with official factory records assure prompt, efficient service.

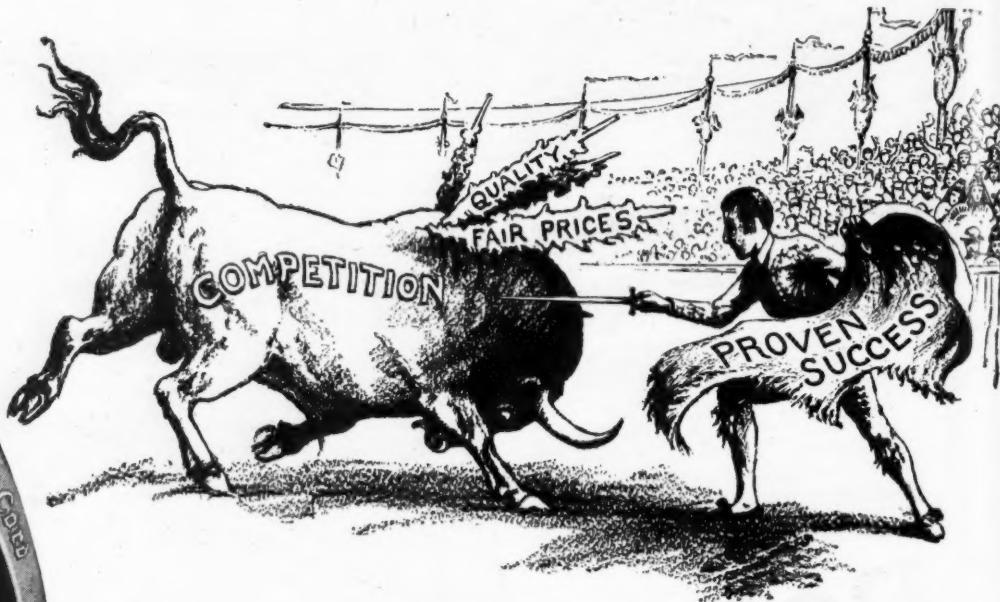
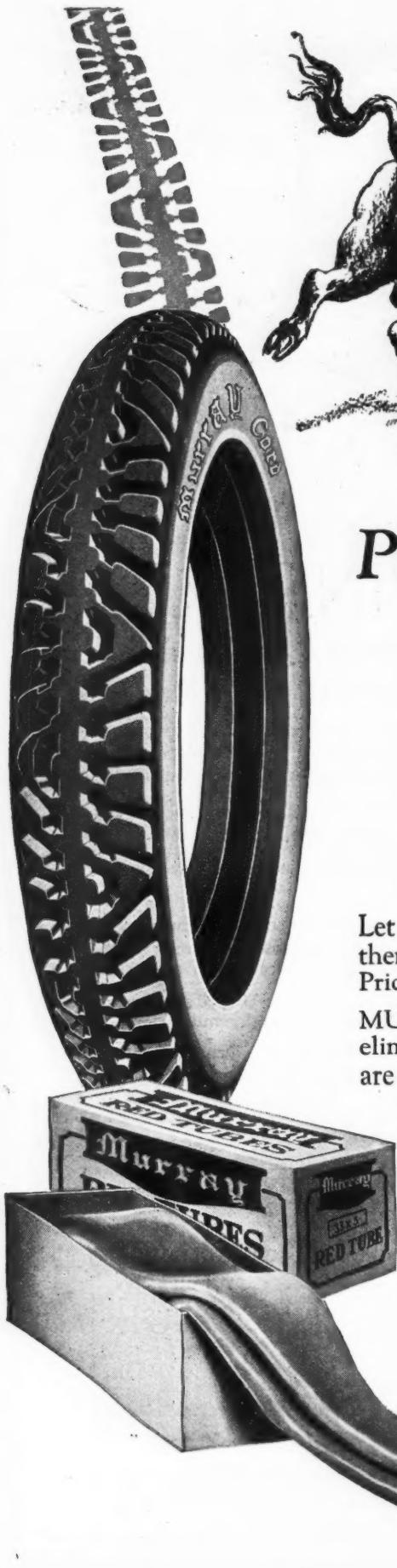
Authorized United Motors Service Stations are at convenient points throughout the United States and Canada.

UNITED MOTORS SERVICE INCORPORATED
General Offices: Detroit, Michigan
Service Stations Everywhere

Branches in Principal Cities

AUTHORIZED UNITED MOTORS SERVICE

Delco Genuine Delco, Electra, Electra KLAXON HORN
Remy Starting, Lighting, Ignition Systems
Hyatt ROLLER BEARINGS
New Departure BALL BEARINGS
Harrison RADIATORS
Taxon FRONT AND REAR SPRINGS
AC REFRIGERATORS



Proven Quality. Fair Prices

The two valuable weapons placed
in every dealer's hands by

Murray
"NOT A
WORRY" **TIRES**
FULL OVERSIZE

Let these two public servants lead the way to your store; let them identify it as a place where "Proven Quality—At a Fair Price" is the first consideration.

MURRAY TIRES are quality—first—last—all the time. But by eliminating all unnecessary waste and expensive overhead, we are able to sell them to dealers at a price which makes it possible for him to meet the growing demand for quality and, at the same time, earn a generous profit.

1923 IS A QUALITY YEAR

Every Murray Tire a Sou'-Easter

Made and tested for the south-east wheel, where the traffic is roughest. The reinforcement on the side wall gives "truck-tire" strength where the strain is hardest.

Write Dept. 1310
for Our Exclusive Dealers' Proposition

Do not delay. Some other progressive dealer in your territory may get the exclusive rights to sell this tire which gives you the generous profits of years gone by and, at the same time, meets the growing demand for quality.

MURRAY
RUBBER COMPANY
TRENTON, N.J.

Announcing

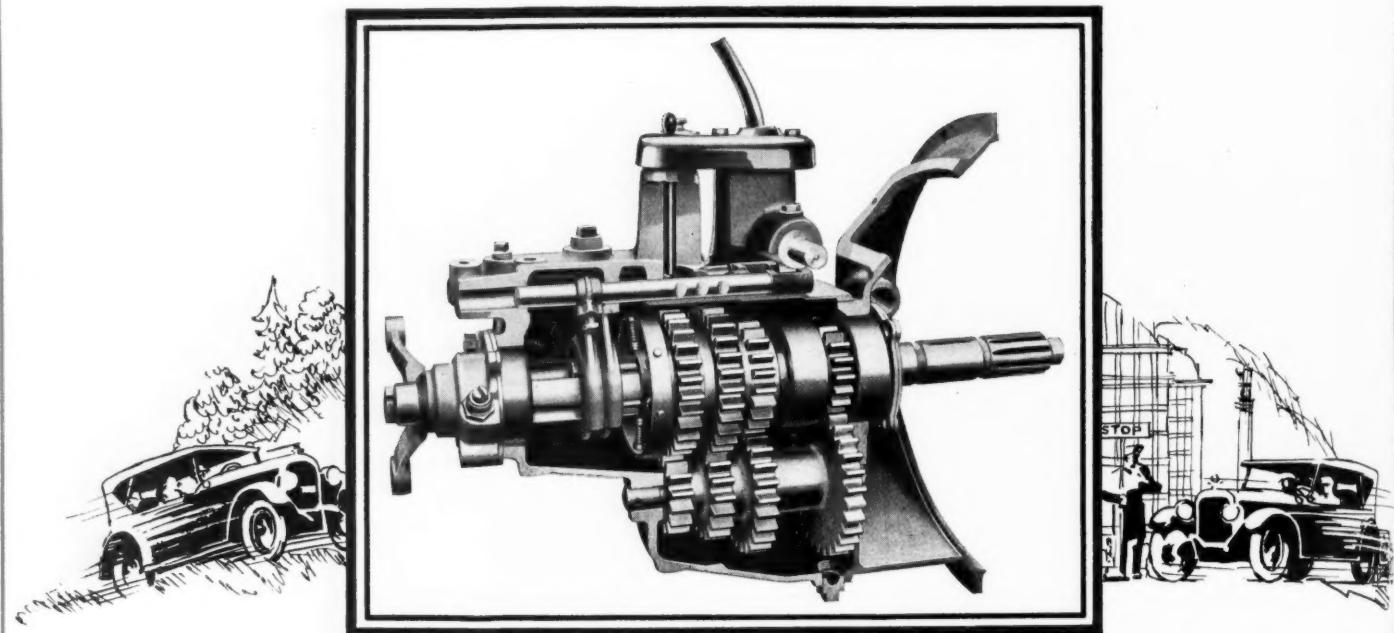
*The
Biggest Advance
in Motor Car
Design since the
Self-Starter!*

Exclusive in the

1924

CHANDLER

THE TRAFFIC



Cutaway view of the Traffic Transmission, which is built complete in the Chandler plant under Campbell patents. Note that the gears are constantly meshed.

It spells the doom of the tricky old gear-shift and makes the 1924 Chandler the easiest and safest car to drive—and the easiest car to sell!

EVERY automobile merchant in America owes it to himself to investigate at once the revolutionary feature of the 1924 Chandler—the Traffic Transmission. To those who are not making enough money from their present lines, it offers the biggest demonstrating and selling feature added to the motor car since the self-starter.

NEW PRINCIPLE USED

And to those not of a mind to change for the present, its patented design and construction will prove of extraordinary interest. It embodies a totally new principle, the simplicity and soundness of which will astonish those who know that thousands of inventors and engineers have unsuccessfully tried to overcome the admitted de-

ficiencies of the sliding gear transmission.

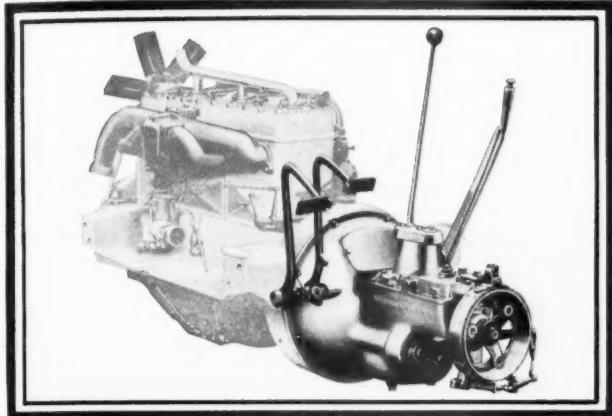
There are no sliding gears in the Traffic Transmission. All its gears are always in mesh—*improving with service* instead of becoming chipped and shattered by unsuccessful shifts.

GEARS CANNOT CLASH

The gears cannot be clashed. At all speeds in the normal driving range, whether going up hill or down, the change is made without grinding or clashing and with perfect surety and safety by the least experienced driver.

To change from high to low requires only the pressure of the little finger on the shifting lever. To go from high back to second and from second to low is equally easy under all conditions.

TRANSMISSION



Showing the Pikes Peak Motor and the Traffic Transmission—undoubtedly the finest power plant assembly ever placed in any motor car, regardless of cost.

SAFEST BRAKE ON HILLS

For braking purposes it is possible to make a split-second change from high to second at 35 miles an hour and from second back to low when occasion arises. Thus the Traffic Transmission acts as

the most positive and powerful of all braking systems—permitting the braking effect of the engine to be instantly applied in equal distribution between the rear wheels.

There are literally millions of persons (especially women) in America who have been kept from the driver's seat because they refused to struggle with the perplexities of the old-fashioned gear shift and its exasperating rasp and whine. To these the Chandler dealer can now offer the greatest delight of motoring—that of sitting behind the wheel and driving with confidence and tranquility.

NOTHING NEW TO LEARN

In the use of the Traffic Transmission there is nothing new to learn. The familiar old gear lever and the familiar old shift positions have been retained. The Traffic Transmission insures a positive, silent, instantaneous shift because its construction eliminates the fundamental fault of the now obsolete transmission—that of trying to mesh two gears spinning at different speeds. Dexterity, experience, or

practice are not necessary. Anyone can do it successfully on the first attempt.

In the Traffic Transmission alone, the dealer selling the 1924 Chandler has a demonstrating feature with an appeal more powerful than any advance in motor car design since the self-starter. And along with it he is able to offer the improved Pikes Peak Motor, another exclusive Chandler achievement.

The industry, as well as the public at large, now generally acknowledges that the Pikes Peak Motor has powers of performance not to be duplicated by any car costing less than \$3000. Its reception since January last has been nothing short of a national triumph. In any locality boasting hills of any consequence, its spectacular high gear capacity is now securely established. In metropolitan centers it is regarded as having no peer in the way it responds to the needs of traffic.

In the 1924 Chandler, the

PIKES PEAK MOTOR

embodies important improvements. Pressure lubrication to the connecting rod bearings supplies these vital parts with an amount of oil that is adequate at all speeds under all conditions. Still other refinements have made the operation of the motor noiseless and flawlessly smooth.



The weight of one finger is sufficient to shift the lever of the Traffic Transmission.

Big Values that Insure Big Sales



TOURING CAR, \$1485—A very popular model, which with its 123" wheel base and low hung chassis, enjoys a most distinctive appearance. Considering its beauty, durability, and the superior performance powers provided by the Pikes Peak Motor and the Traffic Transmission, its price is remarkably low.

With the 1924 Chandler, the dealer can go to the public with the biggest value in the "less than \$2000 class"—the biggest profit class of all.

He can offer the revolutionary Traffic Transmission, with its elimination of all gear-shifting troubles.

He can offer the improved and practically noiseless Pikes Peak Motor with its acknowledged performance supremacy.



CHUMMY SEDAN, \$1785—A 5-passenger closed car of singular beauty and charm—perfectly proportioned, luxuriously comfortable, upholstered and appointed with dignified good taste, and constructed throughout in a sound substantial manner. Undoubtedly the biggest value in fine sedans. (Prices quoted f.o.b. Cleveland.)

He can offer the long-lived, easy-riding Chandler chassis with its rugged rear axle, its efficient brakes, and feather-weight steering qualities.

He can offer handsome open and closed bodies—all of them luxuriously upholstered, completely equipped, and brilliantly finished.

And, best of all, he can quote prices so low that they establish the 1924 Chandler as a value of unusual appeal.

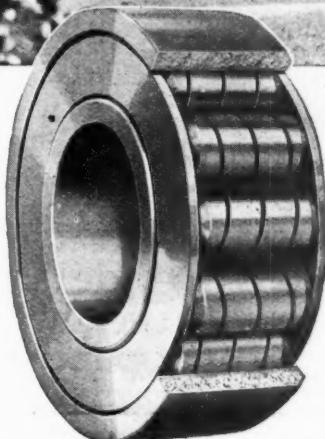
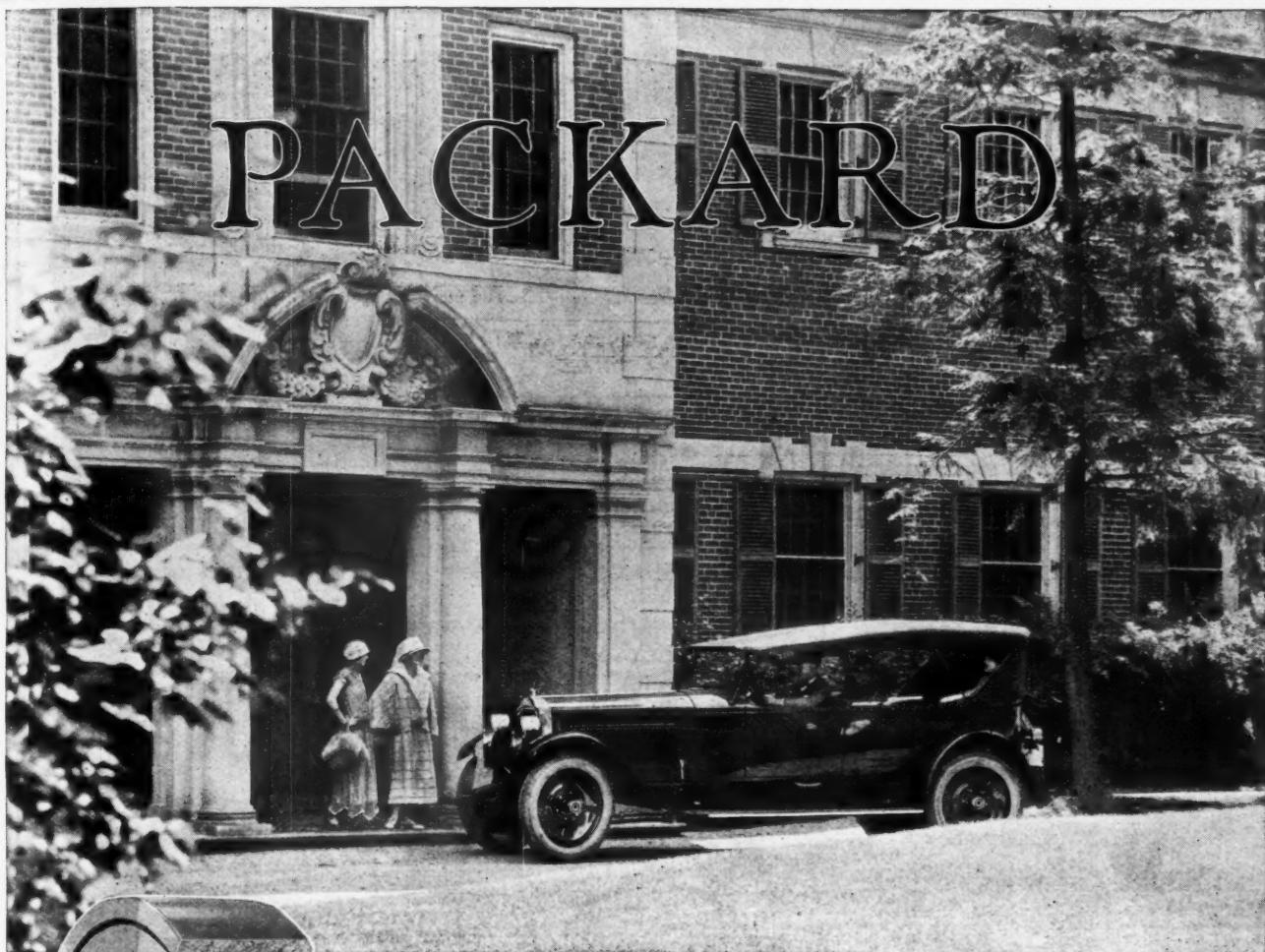
OPEN TERRITORY

We still have left for immediate assignment some very desirable territory. To dealers located therein we can offer the biggest profit opportunity of years—under a liberal franchise that has no termination date.

If you want complete information as to discounts, deliveries, territory, financing assistance, etc., wire or write at once. We will show you how you can make more money selling the 1924 Chandler than any other car of its class.

THE CHANDLER MOTOR CAR CO. CLEVELAND

Export Department, 1819 Broadway, New York
Cable Address, "CHANMOTOR"



PROUD, indeed, of the significance of the phrase "Packard quality," Packard has jealously guarded its reputation even to the most minute part entering into Packard manufacture. Naturally, Hyatt roller bearings have played an important part in Packard Six design. How satisfactory these bearings have proved, is best indicated by their continued presence in the new Packard Single-Eight.

Hyatt roller bearings used in the transmission and on the shaft of the fan and pump unit, assure throughout the life of this car the bearing performance that the world expects and that Packard demands.

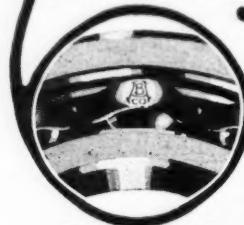
HYATT ROLLER BEARING COMPANY

Newark	Detroit	Chicago	San Francisco	
Worcester	Milwaukee	Huntington, W. Va.	Minneapolis	Philadelphia
Cleveland	Pittsburgh	Buffalo	Indianapolis	

HYATT
Quiet
Roller Bearings



BEARINGS *for every application*

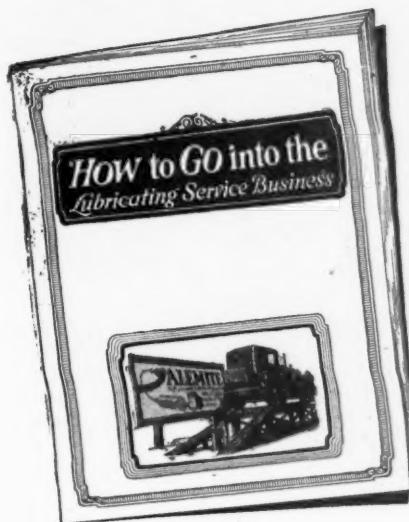


For fifteen years we have been compiling records covering sizes & types of bearings used in all forms of automotive equipment

This information in the possession of each of our 37 Branches renders them especially fit to help you get the correct bearing for any application. When you want bearing information call our nearest branch

BRANCHES
In thirty-seven cities
AHLBERG
BEARING
COMPANY
321 East 29th St. Chicago

How to Pay Your Rent This Winter



Read What Others Are Doing Now

G.P. McIntyre, of Chicago says—"One man with a 2-car rack costing \$100 ought to make over \$5000 a year."

[Mr. McIntyre clears \$10,000 and more per year].

"We serviced about ten cars a day when we started in 1919. Now we handle from four hundred to five hundred a day."—Washburn-Walker Co., Inc., Los Angeles.

"Our business grew from a few cars to fifty-two cars a day. We started with nothing but a rack, a compressor and a barrel of grease."—Universal Lubricating System, Portland, Ore.

"Our great problem now is more room. We get much of our work from fellow dealers. We are looking about for more station locations."—Lubrication Service Co., Denver.

"My rack cost me only \$40. Without a helper I make \$5000 a year and more. With each helper I hire the rate of profit is 30% to 40% more."—R. L. Perkins, Chicago.

"I had only \$200 when I started. I service only Alemite-equipped cars. I'm figuring on several more stations."—Lowry Lubricating Service, Pasadena, Calif.

**\$50 to \$200 extra profit per week
on an investment as low as \$200.**

Send now for free book that tells you how. Any Garage, Filling Station, or Accessory Store can install a Lubricating Service this winter that will more than pay the rent in extra profit.

Thousands make from \$50 to \$200 and more profit per week. On each car you lubricate you make \$1.00 to \$2.00 or more net profit. It also brings in new trade that increases your other business too. Most stations average ten cars a day even to start out. Large stations lubricate four hundred to five hundred cars a day. Keep your men busy this winter on profitable lubrication. We can show you how to start this business on as low as \$200 investment. Send today for free book. Limited edition. The only book of its kind. No obligation.

FREE BOOK

"How To Go Into The Lubricating Service Business"

This book contains plans, facts, figures, successful ways of getting trade and building it up. Brass tack information compiled from actual facts. Send today. It costs you nothing. No obligation.

A Bassick-Alemite Product

THE BASSICK MANUFACTURING CO.
2662 North Crawford Avenue, Chicago, Illinois

ALEMITE

—This Is Worth Sending—Do It Now—

The Bassick Mfg. Company
2662 North Crawford Avenue
Chicago, Illinois

Please send us without obligation, free copy of text book, "How to Go Into the Lubricating Service Business."

NAME _____

ADDRESS _____

CITY and STATE _____



Sam's "Safety First" Campaign

Sam Doesn't Say Much But—
The Card Says a Bushel

Sam Simms, who runs a garage in an upstate town in New York, has a "Safety First" scheme that's all his own.

When he notices that the brakes on a customer's car don't work just right Sam drops him a hint: "Safety First—Better let me line those brakes of yours with TESTBESTOS."

Once in a while the customer thinks he knows better. "Oh, I guess my brakes work well enough. I'll risk it."

"You're the doctor," says Sam. "But before you go—I promised my friend Smithers I'd give you this card, just in case—" Sam fishes a card out of his pocket, and the customer reads:

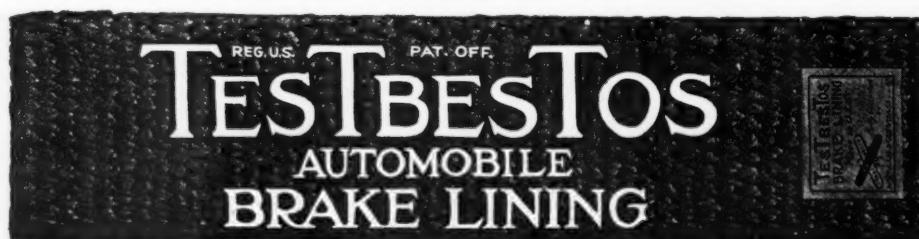
WM. J. SMITHERS, Funeral Director

It's sort of rough on the customer's sensibilities, but Sam gets lots of re-lining jobs.

MAYBE Sam carries the joke a little too far, but keeping your eye on your customer's brakes is part of the good service you owe him. And besides, it will mean more jobs in your shop and more money in your pocket. And if you make every one of those relining jobs a TESTBESTOS job you are giving the car owner the best accident insurance money can buy.

Do you know TESTBESTOS, the Brake Lining that is made of extra long fibred asbestos, woven and interwoven with a base of the toughest of brass wire, and specially proofed against heat, friction, oil, gas and grease? If you don't know it, will you try it *at our risk*? See the Guarantee that covers every foot of TESTBESTOS.

AMERICAN ASBESTOS COMPANY, Norristown, Pa.



**BRAKE INSPECTION—
—YOUR PROTECTION**

**THE TESTBESTOS
GUARANTEE**

If any piece of Testbestos Brake Lining fails to give absolutely satisfactory service, return it to us and we will send you a new piece without charge.

**AMERICAN ASBESTOS CO.
Norristown, Pa.**

Please send me the name of the nearest TESTBESTOS jobber.

Name

Address

A drill is a “better drill” with the right Chuck Equip- ment



PORTABLE Electric Drills were developed to meet the necessity for better, quicker work—but without good chuck equipment they lend nothing to the job.

Jacobs Chucks, selected as standard equipment by manufacturers of the best drills made and used in the industry were determined upon because of their accuracy and strength combined with The Toothed Sleeve and Key device for operating.

The mechanic uses one hand only for tightening, leaving the other free for holding the spindle. Tools are easily and securely fitted into place in Jacobs Chucks. Time is saved. Efficiency is brought up to its highest level.

Jacobs quality is responsible for this. Jacobs quality is YOUR guarantee.

THE JACOBS MFG COMPANY, HARTFORD, CONN.

*This advertisement inserted in the interest
of better Service Equipment in general and
the use of Portable Electric Drills in particular*

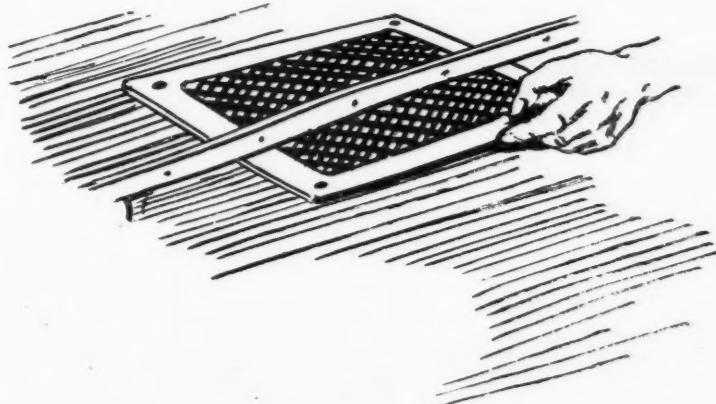


THE INDEPENDENT
PNEUMATIC TOOL CO.
CHICAGO, ILL.

Thor

Installing Heaters--

Electric current is cheaper than man power and it never gets tired. Drilling through floor boards with a portable electric drill is the modern way of speeding up the job. Neat work, quickly and neatly done—and economically done, as well.



[CATALOGED]
in the Red Directory

“Speed Up Service With Machine Tools”

ONLY

10

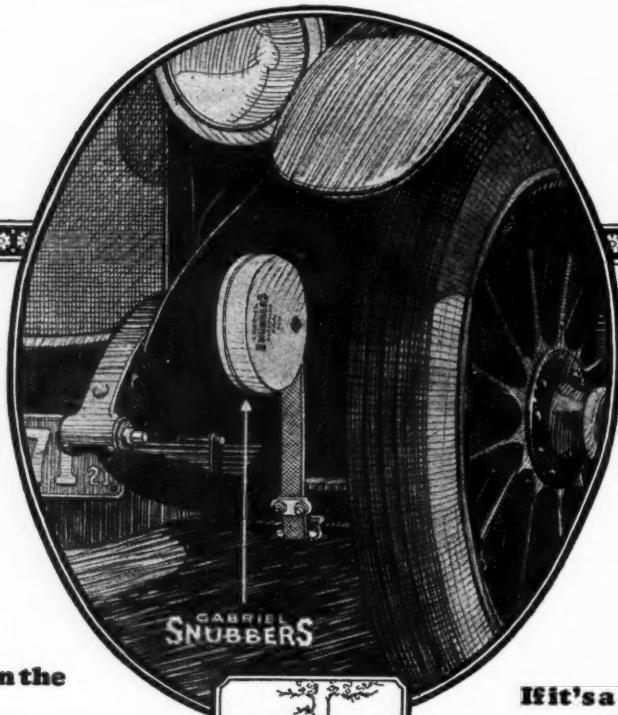
Manufacturers of passenger cars who produce 1000 or more cars a year do not standard-equip with Gabriel Snubbers or put holes in frame for them.

71

Manufacturers do
Sold by legitimate dealers

GABRIEL MANUFACTURING COMPANY
1415 East 40th St. Cleveland, Ohio

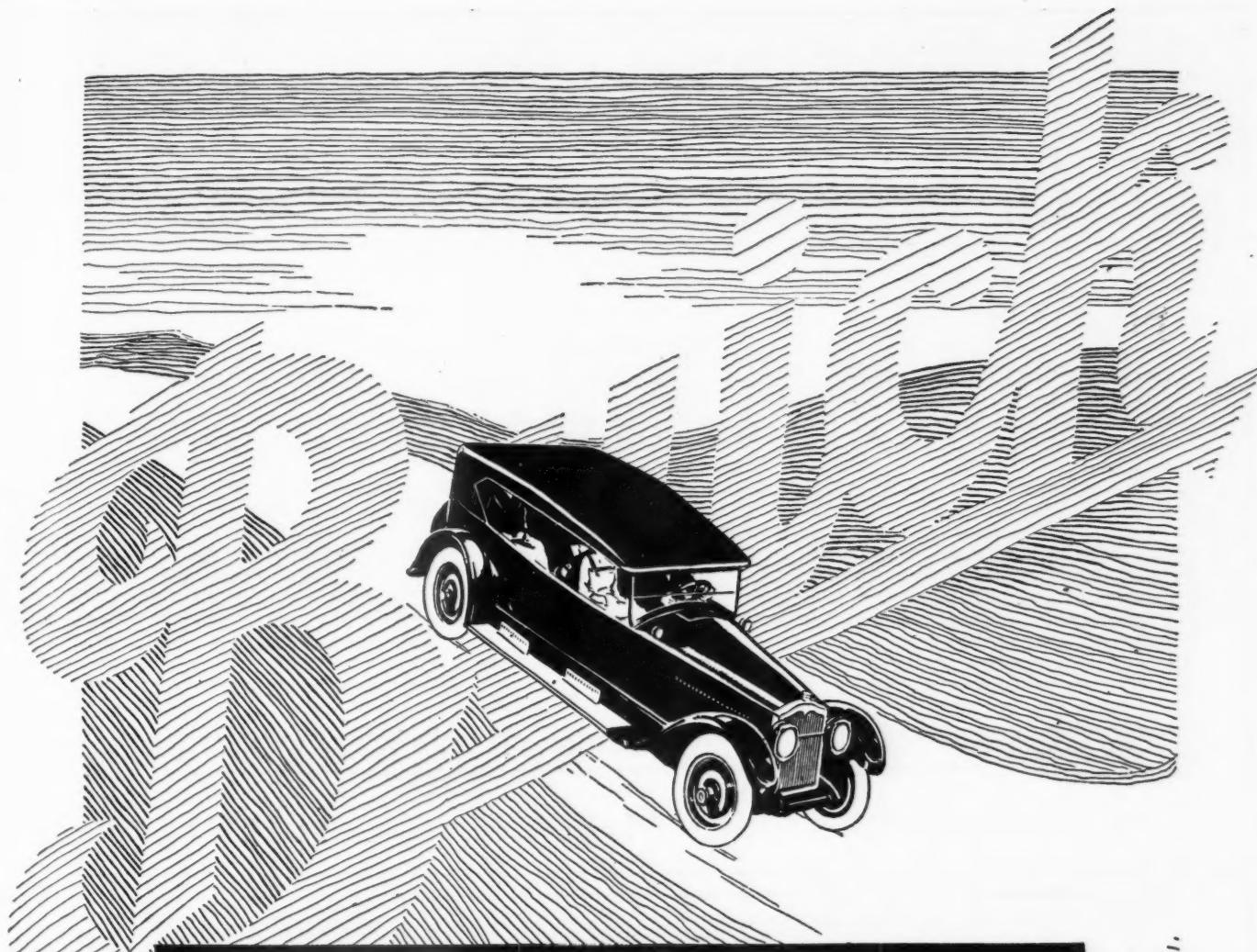
GABRIEL
SNUBBERS
THERE IS NO OTHER



Keep You on the
Seat
Save Your Car



If it's a Snubber
—it's a
"GABRIEL"



More Grip on the Road!

Buick Four-wheel Brakes

Buick four-wheel brakes give all 1924 Buick cars twice the amount of grip on the road, thereby doubling their braking efficiency. It is the friction or grip of the tire on the road surface that brakes or slows down the car.

Buick four-wheel brakes not only provide a greater power to stop in case of emergency but, because of this four-wheel road grip, reduce skidding dangers to a minimum.

In turning, Buick four-wheel brake construction automatically releases whichever is the outside or guiding front wheel so it is instantly responsive to the steering mechanism.

Buick four-wheel brake construction distributes braking friction over four drums and four wheels. This reduces wear on brake linings and tires, thereby assuring their longer life and greater efficiency, with fewer adjustments.

Buick four-wheel brakes [on all models] together with countless other distinctive features of the 1924 cars further establish Buick as the Standard of Comparison.

BUICK MOTOR COMPANY, FLINT, MICHIGAN
Division of General Motors Corporation

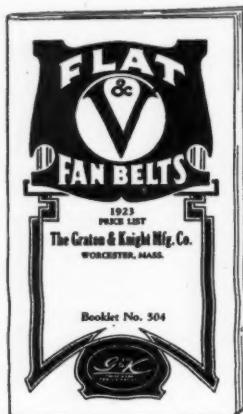
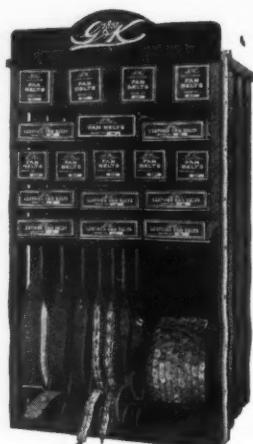
Pioneer Builders of Valve-in-Head Motor Cars
Branches in All Principal Cities—Dealers Everywhere

When better automobiles are built, Buick will build them

IT IS OUT!

G. & K. BOOKLET No. 504

The Complete Fan Belt Data Book



IT WILL HELP YOU SELL
G. & K. LEATHER
FAN BELTS

REAL STEER HIDE BELTS; NATURAL COLOR

The Graton & Knight Mfg. Co., Worcester, Mass.

From Now On You'll Need Only

ONE Terminal for ALL Batteries

O P's "ALL-IN-ONE" Vise Type Battery Terminal



O P's "All-in-One" is the only terminal that can be used on all standard batteries.

Vise type. Securely grips positive, negative or straight post on battery. Comes off in a jiffy when you are in a hurry.

A bronze-alloy terminal electro-plated with 99% pure lead.

Cut down your terminal investment. Cut down your terminal stock. Cut down time lost in hunting for the "right" terminal. Use O P's "All-in-One" on every job.

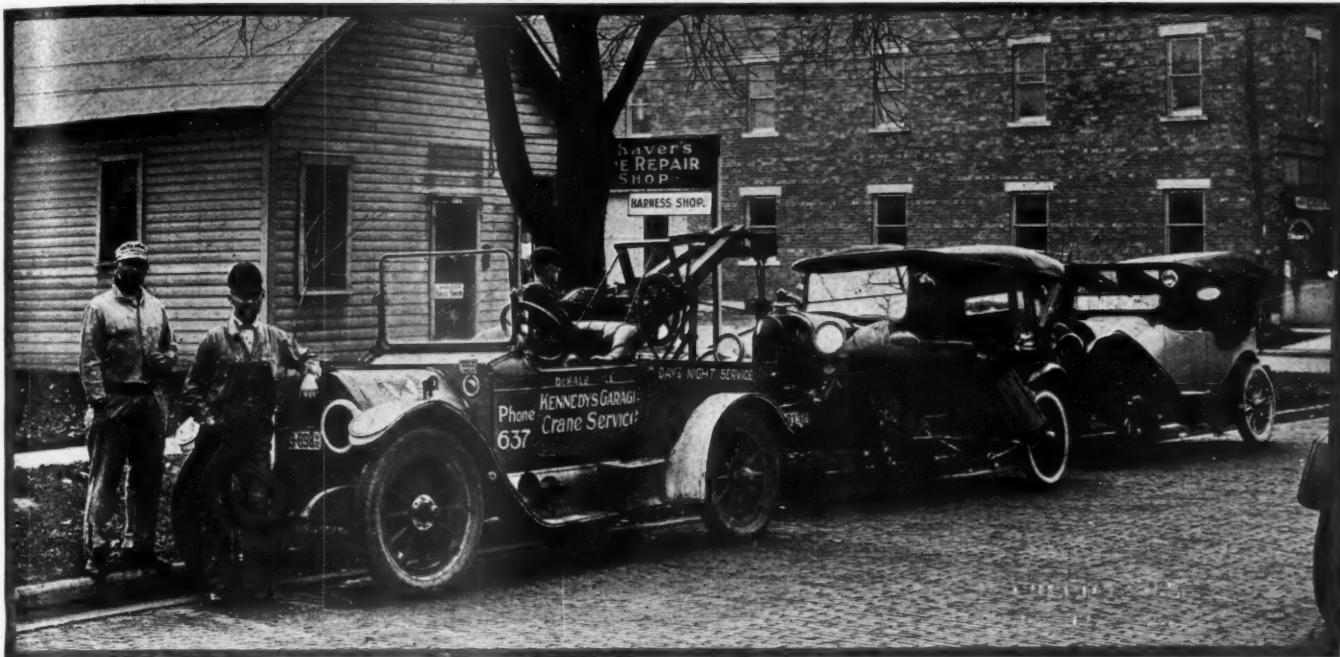
Order From Your Jobber—He Stocks Them

THE OHIO PARTS CO.
3317 Colerain Ave. Cincinnati, O.

Free Sample

One sample will tell you more about this Terminal than a hundred page book!

Just write this on your letterhead: Send me ONE O P "All-in-One" Battery Terminal and jobber's name.



Photograph furnished by Kennedy's Garage, DeKalb, Illinois

2 at a time with the MANLEY



“Some Wrecking Crane”



They came together—at a crossroad. Both were wrecked—and both were brought in AT ONE TIME. This is no stunt—just the regular everyday stuff, that any garage can do with the Manley Combination Wrecking and Portable Floor Crane.

The Manley is a development of years of improvement—every detail WORKS—everything there is for a definite purpose. It mounts on any chassis without the expense of special forgings, etc. Just bolts on. Comes off in three minutes when it can be used for a floor crane. Two cranes in one.

The Crane Beam tilts at any angle—another reason for MANLEY ability to pull any wreck out of a hole. FOUR different leverages.

All structural steel members, riveted and bolted together into a unit that can make any wrecking job a mere matter of going out and bringing it back, a good, fat repair-job.

Manley Wrecking Cranes pay for themselves in a few weeks—they brings in REAL repair-jobs, they advertise your garage as a live repair shop, and frequently sell NEW CARS to the owner of the wreck.

Three sizes. Special bulletin—and special prices—on this and other Garage Equipment. Write.

MANLEY MFG. CO. YORK, PA.

Manley Garage Equipment

MADE IN YORK PA.



D-P Accelerator for Fords

Retails at \$2.50

What Does D-P Mean? Dealer Profits, of Course

When you see anything marked D-P, you can bet it's a quick mover at a good discount. Take this accelerator for Fords, put a dozen on your shelf, and watch them move off. You'll be surprised.

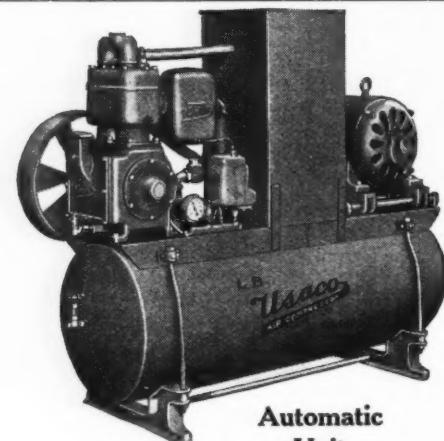
It offers such convenience, comfort and safety to every Ford-owner that mighty few of them can resist. After a week's use they are glad they didn't.

There are mighty few come-backs and complaints in a trainload of D-P accelerators.

Only a hundred selected jobbers can handle D-P products. Ask for the name of the nearest, if your jobber doesn't handle them.

Davis-Palmer Company
4750 Sheridan Road, Chicago, Ill.

A handsome mahogany finished display stand will be furnished each dealer with his first order for 12 D-P accelerators. It will help you sell them.



Automatic Units

Equipment LB-5
Single-Stage
Displacement, 20 Cu. Ft. per minute.
Motor, 5 H.P.
Working Pressure, 150 pounds.

Equipment LB-3
Two-Stage
Displacement, 12 Cu. Ft. per minute.
Motor, 3 H.P.
Working Pressure, 200 pounds.

Equipment LB-2
Two-Stage
Displacement, 8 Cu. Ft. per minute.
Motor, 2 H.P.
Working Pressure, 200 pounds.
Air Tanks, 76 Gallons Capacity.
Cooling Tanks, 30 Gallons Capacity.



The Simple
Compressor
furnished
as illustrated
or with tight
and loose
pulleys

New Heavy Duty Water Cooled

Two Stage **Usaco** AIR COMPRESSORS TRADE MARK Single Stage

Here's a "bear" for service—a "husky" water cooled compressor built to withstand continuous service, hour after hour, day after day, for many years.

It is, therefore, specifically adapted for factory use, or for the large garage having many air uses in addition to tire inflating, such as: operating air hoists, air tools, and gasoline dispensing pumps, cleaning motors, opening and closing doors, etc.

This LB compressor is self contained, fully automatic in operation, compact in design, and uncommonly sturdy in construction, with all parts readily accessible. New refinements, combined with Usaco features of proven worth, afford the most practical heavy duty compressor ever designed. The price, also, is surprisingly low. "Nuff" said. Investigate at once.

The United States Air Compressor Co.
5304 Harvard Ave., Cleveland, Ohio



BABBITTING BEARINGS

TORIT TORCH OUTFIT NO. 13

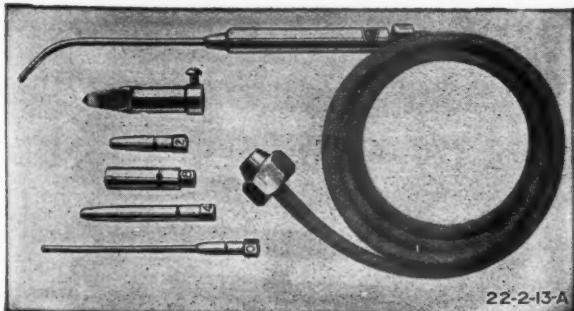
A TORIT TORCH No. 13 will not only do radiator repairing quickly and efficiently, but saves time in general soldering, wire splicing, light brazing, loosening corroded nuts and bolts, and hundreds of other jobs. Thousands in use are earning big profits.

Uses Acetylene Only

A splendid use for old auto-acetylene tanks. Easily carried to the job. Ready the instant you light torch.

Outfit complete including torch, 4 different tips, soldering copper, 5 ft. hose and tank connection

\$7.50



22-2-13-A

Order from your jobber, or

ST. PAUL WELDING & MFG. CO.
169 W. Third St. St. Paul, Minn.

SPOOL FITS THE HAND

As shown below, the one pound spool of Kester Acid-Core Wire Solder fits the hand comfortably—likewise the one pound coil that comes in a carton. Both of these sizes are "handy" for the tool kit and for carrying from job to job. The far-sighted garage owner carries also the five and ten pound spools which are ideal for bench and routine work, and are a bit more economical.

With Kester "one requires only heat" because it supplies a scientific flux in the tiny pockets inside a virgin tin and lead solder. This eliminates bothering with messy acid pots, swabs, sticks and brushes, and permits better work with less time and material.

"Sample for Test Upon Request"

Sold by live dealers everywhere in one pound coils, in cartons, and on one, five and ten pound spools



Manufacturers

CHICAGO SOLDER COMPANY

4203 Wrightwood Avenue, Chicago

Direct Factory Representatives:
THE FAUCETTE HUSTON CO.
Chattanooga, Tenn.

LOUIS J. ZIESEL CO.
216 Market St.
San Francisco, Cal.

DAVIES-ELY CO.
66 W. Broadway
New York City

KESTER Acid Core WIRE SOLDER



Requires Only Heat

**No. 5-A
Reliable**



A Ball-Bearing Jack with a 24-in. Detachable Folding Handle

The extra long, detachable handle makes this Jack easy to push under any axle. And once it is under, a few turns of the handle will raise the car with ball-bearing ease. No stooping, no straining—perfect operation.

Strong

All Reliable Jacks are sturdy and strong

Note the illustration—see the unusual broad base and over-size stand. Then there is a corrugated top with an inch and a half flip cap, resting on a full size $\frac{1}{8}$ -inch screw. Both gears are malleable. Built to withstand heavy strains.

Easy to Operate

All Reliable Jacks are easy to operate

Perfectly meshed gears ride on a thrust bearing and all are thoroughly packed in grease before leaving the factory.

Dependable

All Reliable Jacks are dependable

The very nature of the construction of this No. 5-A insures instant and unvarying dependability. The stand is completely sealed top and bottom—no chance for dirt or foreign matter of any kind to interfere with screw or gear action.



ASK 'EM TO BUY

**Elite Manufacturing
Company**

Department MA-10 Ashland, Ohio.

**SPECIAL OFFER
TO DEALERS**

Fill Out and Attach This Coupon to
Your Letterhead

ELITE MFG. CO., Dept. MA-10
Ashland, Ohio: Please mail me
one of these jacks. You may bill
me through my regular jobber

whose name is.....

Name.....

Address.....

City.....

State.....

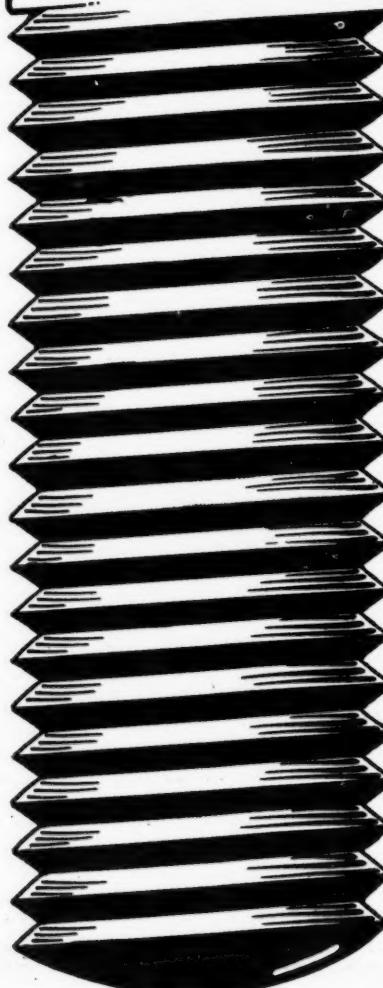
Cap Screws

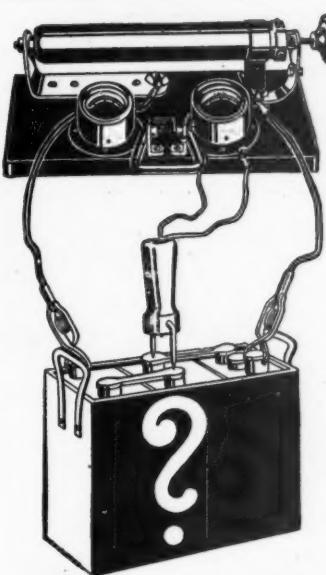
Uniform Texture

One reason Victor Cap-screws deliver satisfaction day in and day out is their uniform texture. The Bright Forged Process gives to Victor screw products flawless threads and an absolute freedom from weak spots, crystallization and internal strain.

Thus Victor Bright Forged Process has come to mean reliability and complete confidence wherever screw products are used.

VICTOR-PENINSULAR CO.
DETROIT, MICH.





Locate Battery Troubles with the L-2502 Test Set



Buckled Plates—The result of overcharging in hot weather, destroys thousands of batteries every year. Do you get your share of the replacement business?



Rotted Separators—An annual trouble in most of the millions of batteries in use, means profitable repair work. Can you detect this trouble quickly?



Doped Electrolyte—Another trouble that fools many automobile men in service work. Can you tell whether your customer has doped electrolyte in his battery?



Frozen Cells—A regular winter occurrence means thousands of replacement batteries to be sold. Are you in line to get a good share of this business?



Loose Connectors—A hard thing to find with improper test sets. Are you equipped to detect a loose cell connector quickly and save delay to your customer?

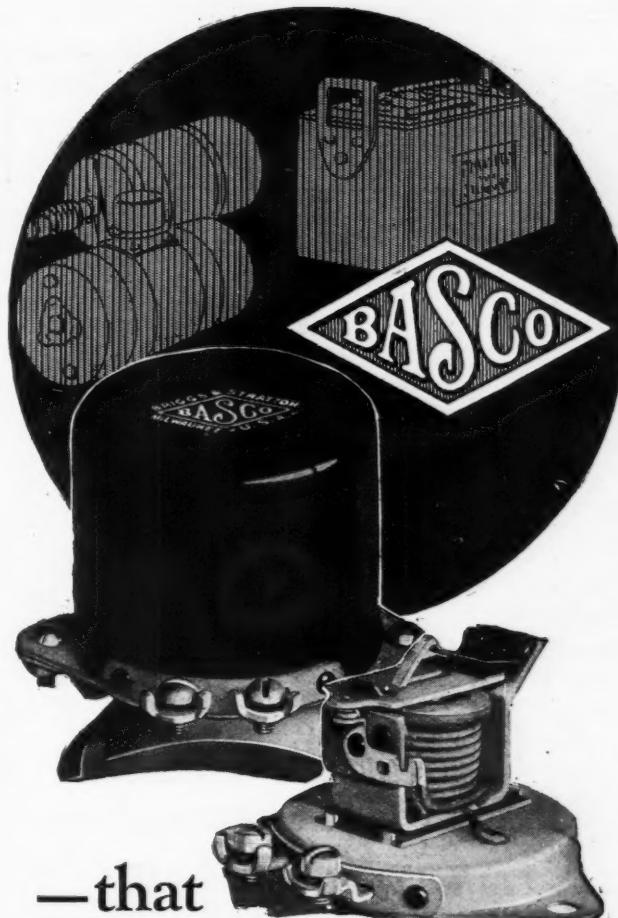
*Put your shop on a profitable basis by
using the Chart Method of Testing*

Allen-Bradley
TYPE L-2502
HIGH-RATE DISCHARGE TEST SET

Allen-Bradley Co.
Electric Controlling Apparatus
281 Greenfield Ave.

Milwaukee, Wisconsin

Please send us your latest bulletin on the Chart Method of
Battery Testing and a reproduction, in color, of the test chart.



—that
Small Unit with the
BIG Responsibility

TUCKED away under the bonnet, the generator cutout is unseen and unknown as far as the average motorist is concerned. When it goes wrong and you replace it, your reputation demands a renewal unit of unquestioned dependability. Renew with the genuine



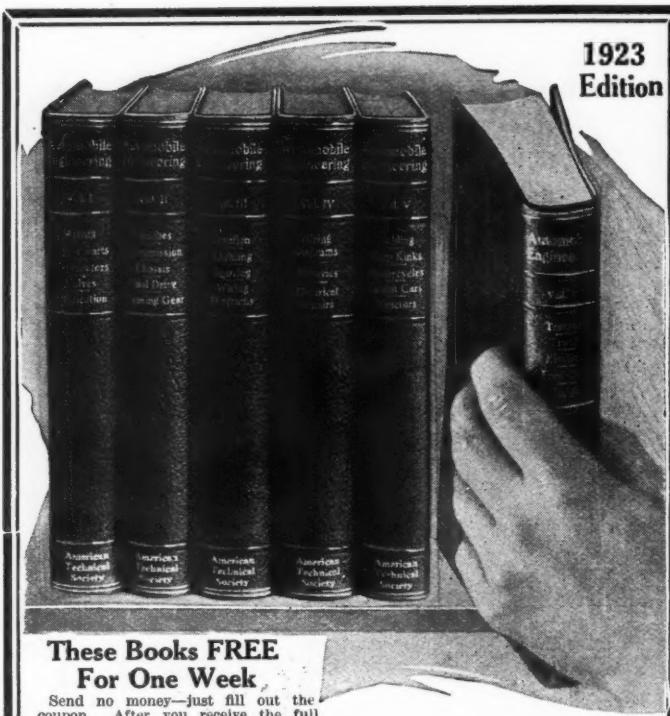
**Generator
Cutout**

the cutout of absolute reliability. Hundreds of thousands of Basco Generator Cutouts are giving consistent, unfailing service on many varied makes of cars.

Embodying the experience, manufacturing knowledge and skilled workmanship that in 12 years have made Briggs & Stratton automotive electrical components standard equipment on a large percentage of the leading makes of cars and trucks, the Basco Generator Cutout is the ideal renewal unit. Write for name of nearest Basco distributor.

Heavy series winding; high resistance shunt coil; solid, riveted assembly; pure coin silver contacts; special bracket for Ford mounting; guaranteed to give complete satisfaction. List prices: No. 1655, 6-volt, 15-amp., \$2.00; No. 1441, 12-volt, 15-amp., \$2.55.

Briggs & Stratton Co.
Milwaukee, Wisconsin



**These Books FREE
For One Week**

Send no money—just fill out the coupon. After you receive the full set of books, express collect, read them over and test them out for seven days. If you don't want them, send them back at our expense. If you decide they will do for you what they have done for more than 100,000 others, pay \$2.80 within one week and \$3 each month thereafter until the special price of \$21.80 is paid. This amounts to only ten cents a day. Mail coupon NOW if you want a bigger, better job at higher wages.

**All Automobile
Engineering Facts
at Your Fingers' Tips**

**Six Complete New Books for Study or Reference
Also Year's Consulting Membership in
American Technical Society—FREE**

Here's the most practical set of books ever written on automobile engineering. Each book is brimful of information about the various phases of this work. 2,600 pages, 2,300 pictures and diagrams, 125 blue prints on every subject. Practical problems are solved in everyday language. They make automobile engineering as plain as day. Completely cross indexed for ready reference.

Know All About Automobiles and Earn Big Pay

These are just the books for the man who wants to know all about automobiles and fit himself for a big-paying job. They are interesting from start to finish and crammed with information. A little regular reading in them during spare hours will soon equip you for the automobile business. Then after you get into the auto game, you'll still have them for reference.

Let These Books Solve Your Daily Problems

To the man now engaged as a mechanic or shop foreman, these books will give a world of help. They dig deep into the technical angles and theories and explain them in everyday words. If you have trouble on any point, you'll find the answer in these books. They are the work of fifteen auto experts who know from experience, the problems and difficulties of the shopman.

Repair Your Own Car

The car-owner will find these books extremely valuable as an aid in repairing his own car. Think of the heavy repair bills this will eliminate. Think of the money you can save.

FREE Consulting Membership

A resident consulting staff of 18 practical experts is waiting to solve for you any auto, tractor or motorcycle trouble that you may have. A letter or a wire to the American Technical Society will bring you an immediate answer and the solution to your problems. This advisory staff of practical automobile men plus your library of Automobile Engineering will enable you to handle successfully any auto job. These men know all the latest methods and the newest and best ways of doing things. Let this pay-raising consulting staff be YOUR SILENT PARTNER. Use this service daily if necessary.

This free consulting membership offer is good for a limited time only and can be withdrawn without notice.

AMERICAN TECHNICAL SOCIETY
Dept. A-741

Chicago, U. S. A.
© A. T. S. 1923

American Technical Society, Dept. A-741, Chicago, U. S. A.

Please send me a set of Automobile Engineering, for seven days' FREE EXAMINATION, shipping charges collect. I will examine these books thoroughly, and if satisfied, will send \$2.80 within seven days and \$3 a month until I have paid the special price of \$21.80. If I decide not to keep the books, I will return them within one week at your expense. It is understood that if I keep the books I am entitled to a FREE Consulting Membership in the Automotive Division of the Society.

Name _____

Address _____

Reference _____
(Please fill out all lines, give local merchant, banker or employer as reference.)

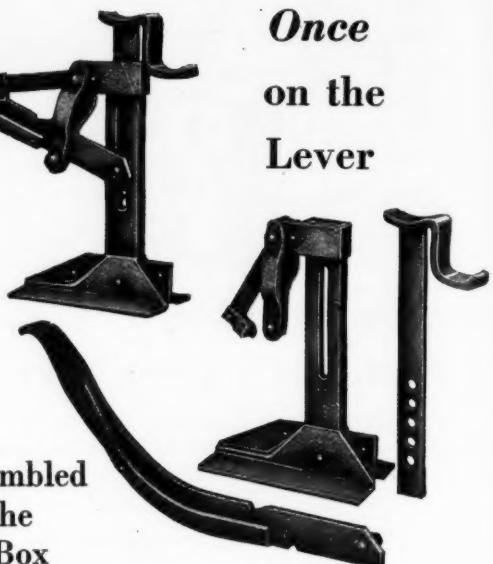
HENRY

One-Lift Auto Jack

—Just Step

Once
on the
Lever

Ready
for
Action



It's a Seller

If There Ever Was One!

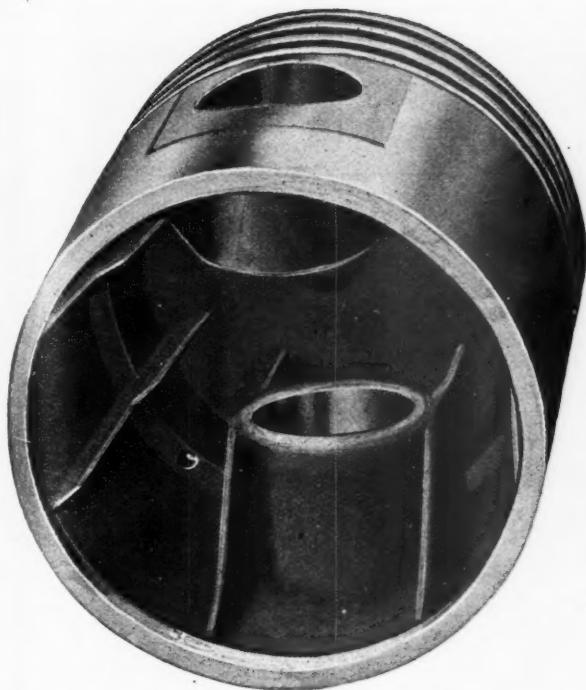
Henry saves the light-car owner so much work and time that it is no trick at all to sell practically every one who comes in. Just step once on the lever, and Henry lifts any light car four inches. Step on the lever again, and the car is eased down onto the road. Five height-adjustments make Henry fit any hump or rut in the road.

The base has 26 square inches, so it stays on top of soft ground. A safety trigger prevents Henry from dropping under load. The lever MUST be deliberately pressed.

The speed, ease, cleanliness and unbreakable all-steel construction of Henry make it a fast mover. Ask your jobber for a dozen now. You'll profit.

Connections with reliable, responsible distributors are now being made. Write for full details.

**Wolverine
Specialty
Company, Inc.
Battle Creek, Mich.**



**RE-POWER YOUR MOTOR
with
FOSTER
sensible light weight grey iron
PISTONS**

Plenty of metal in the head makes it self-supporting and provides ample heat carrying capacity to prevent overheating and premature ignition.

The side walls are thin, of uniform thickness and strengthened by ribbing—straight and shallow. This type ribbing expands uniform with the piston walls eliminating distortion.

They range from 30 to 40 per cent lighter than the ordinary factory types of grey iron pistons, consequently they give more power. Every user is a satisfied user.

**The F-J
Piston
Reamer**



*Adjusts Like a
Micrometer*

You can fit more wrist pins and do it better with the F-J piston reamer than any other tool on the market. A trial will prove our statement correct.

You can get them in sets or anyway you wish.
Have you seen our Reamer catalog?

FOSTER-JOHNSON REAMER CO.
1046 Beardsley Ave. Elkhart, Ind.



**INTERCHANGEABLE
TYPES**

BETTER SUITED FOR SOME JOBS

200 SERIES



**HANDLES
1100 SERIES**

**100
SERIES**

**Complete assortment of
sockets—hexagonal and
square**

There is a Walden - Worcester wrench for every automotive need, and where there is a wide variety of nuts to be handled the Interchangeable Set will meet the requirements.

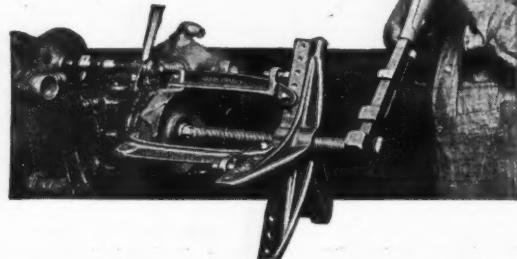
This set comprises the 1100 handle series, together with the 100 and 200 series of sockets.

**Popular shapes of handles
made from heavy stock
suitable for hard service.**

The dealer will quickly recognize in this set an appeal to car owners that will stimulate rapid turnover and yield a profitable reward for placing it in stock. Write to your jobber for this and other Walden-Worcester wrench equipment.

**WALDEN-WORCESTER
INCORPORATED
WORCESTER, MASSACHUSETTS**

**Nothing Is Tight
To This
"Crowfoot" Model**



Latest design in a family of wheel pullers. A two-arm or three-arm model as you require—a UNIVERSAL Wheel Puller.

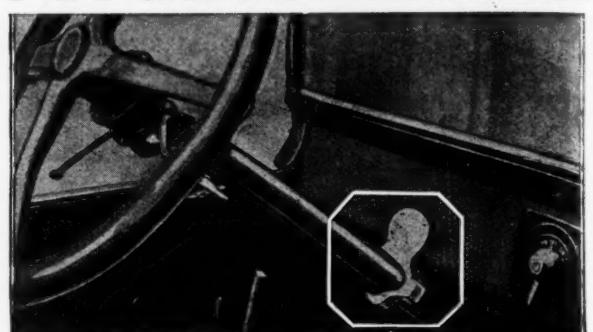
Arms drop forged from high carbon steel, screw case hardened with inserted hardened tool-steel point. Guaranteed against defects.

Made in 4 sizes. Other models, too. Equipped with LOCKING Arms.

Our 24-page folder tells all there is to know about pulling tools.

CRANE PULLER CO.
ARLINGTON, MASS.

D & D STEERING COLUMN BRACE



Proven!!!



Has a beautiful nickel finish not affected in any way by climatic conditions. List price \$1.50. Liberal discounts. Built up to a standard—not down to a price.

The great value of the D. & D. steering column brace for Fords has been absolutely proven. All new Fords are now factory equipped with a brace of this kind. But there are six million Fords running not originally equipped. Over 250,000 of these have bought the D. & D. brace. There will be hundreds of thousands more sold because it makes steering easy over the roughest roads.

Notice on the new Fords what a brace of this kind means, then order the D. & D. from your jobber. Installed in two minutes without drilling or boring. If your jobber doesn't carry it in stock write us direct for a trial order of six or a dozen, but please be sure to send us the name of your jobber.

Manufactured by
L. H. Daley & Co.
Columbus, Ohio

Nature

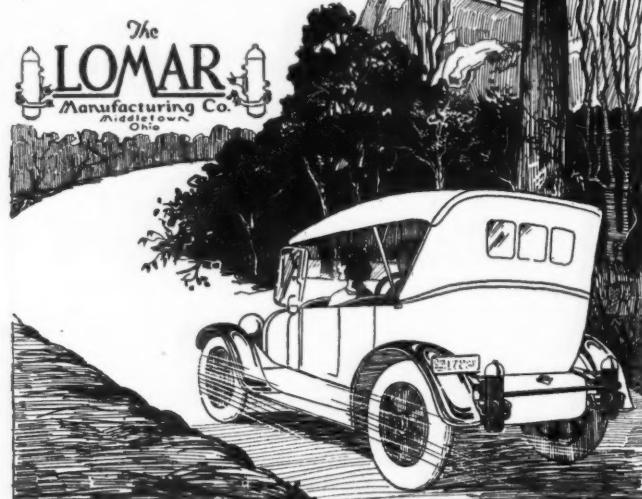
To enjoy nature at her best—get off of the beaten tracks—back on the dirt roads—nature's own.

But equip your car with

LOMAR
SHOCK ABSORBERS

the trouble proof—perfect riding absorbers.

Send for our booklet—It's free



"ATLAS" RADIATOR
FOR
FORD CARS and TRUCKS

**ATLAS SHELL
WITH "ATLAS" CORE**



**STANDARD FORD SHELL
WITH "ATLAS" CORE**



NOTE HOW PERFECT THE STANDARD FORD SHELL FITS THE "ATLAS" CORE

INTERCHANGEABILITY

—a big word that means a lot to the Ford owner and the dealer.

The shell of the "ATLAS" radiator is interchangeable with the regular standard Ford shell, and therefore it is not necessary to buy the "ATLAS" complete. Installing an "ATLAS" core

saves money for the owner and has an appeal, that makes ready sales for the dealer. Write for details.

The Steidle Mfg. Co.
Cincinnati, Ohio

Exclusive Foreign Distributors:
The A. C. Vanderpoel Co., Inc.,
11 Moore Street, New York City

5

Features
of the
FORD FAITHFUL
OILING SYSTEM

50% Longer Life for Fords

It is a positive fact that the Ford Faithful Oiling System, through 100% effective, never-failing lubrication, imparts at least 50% longer life to the Ford power plant.

50% Greater Efficiency

Perfect lubrication also means much greater efficiency; smoother operation; more power, pep and speed; less vibration and carbon.

Motor Troubles Eliminated

The perfect lubrication as supplied by the "Ford Faithful" eliminates the danger of burnt-out bearings, scored cylinders and other motor troubles.

Absolutely No Comeback

The "Ford Faithful" proves satisfactory **EVERY TIME**. Oil is not taken from around the magneto plug—therefore positively no danger of short circuiting or clogging.

Easy to Sell

Dealers not only find the Ford Faithful Oiling System easy to sell on account of its being a positive necessity, but also on account of every Ford owner who buys one is so delighted that he tells all his friends. Write for particulars and quantity prices on this fast selling Ford necessity—**RIGHT NOW**.

The Ford Faithful Oiling System is fully covered by basic patents. Dealers therefore have no competition and all infringers will be vigorously prosecuted.

W.O. Thompson Mfg. Co.

330 Mountain View St.
Pasadena California

No Connection with Ford Motor Co.

Meilicke Signals



Fine
for the
Car
for
Christmas

Check-Stop

Quality must always be the first consideration when buying a gift—no one will give a friend shoddy goods. That makes Check-Stop a remarkably suitable gift for a car-owner. It is quality all through, will give steadfast service for years, and keep its good looks to the last minute.

Push Meilicke Signals as Christmas gifts, for there is an appropriate one for every car and for every purse.

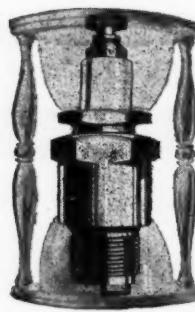
Check-Lite

tells if faulty wiring causes Meilicke Signals to fail. It glows when the signal glares its warning. It remains dark if the signal does. It consumes no extra current; it is installed by boring only one hole.



Christmas giving will increase Christmas buying. Get a little over your share by asking most of 'em to buy Meilicke Signals. Write your jobber today.

MEILICKE CALCULATOR CO.
WRIGHTWOOD AVE.
CHICAGO ILLINOIS



The Life of a Spark Plug is as Long as the Insulator

You'll have to admit that a spark plug has a rather tough life of it. The first thing that fails is the insulator and then it's "good-bye spark plug." It's therefore quite necessary to see that the insulators in the spark plugs you buy are the best.

Spark plug manufacturers say "775" insulators are the best. They back their statement by using "775" in their spark plugs. If you want to use spark plugs which resist heat better and cost no more, look for "775" on their porcelains.

"775"

FRENCHTOWN PORCELAIN CO.
Trenton, New Jersey

"Established 1910—
Busy Ever Since"

STANDS THE TEST

Increase the EARNING capacity of your garage

by using DICKERSON Turntable and Service Jacks. Cars moved instantly—easily. Spring replacements and chassis repairs made in much less time—raises car frame by any fraction of an inch, making bolt holes line up perfectly. Works where no other jack will—does work impossible with others. Mechanism like heavy truck drive. Handles all cars—bumpers, trunk racks, etc., do not interfere. One man easily raises heavy truck. Write for catalog. Some valuable territory open for "live jobbers."

C. A. Dickerson Compressor Corp.
220-222 Chicago St., Buffalo, N. Y.

DICKERSON
GARAGE JACKS
AIR COMPRESSORS
SHOP EQUIPMENT



Turntable Jack No. 11



To Make This Your
Busiest Christmas



\$2.00
each

Retail Price
Order by Color
Canary, Gold,
Pearl, Blue,
Green and Cut
Glass

BENZER
Iridescent
FLOWER VASES

TWELVE vases, each in its own carton, are conveniently packed in a striking hardwood display cabinet, illustrated above. Sent you FREE with order for at least 12 vases. Keep it on the counter and Benzer Flower Vases will sell on sight.

Get in touch with your jobber today!

THE BENZER CORPORATION
Myrtle and Cooper Aves., Brooklyn, N. Y.

"Something for the Car
for Christmas"

BENZER
AUTOMOTIVE
GLASSWARE

PERFECTION

"A Trouble Proof Job That Stays Put"



PUMP PACKING

Does it work so well that every shop should at least try it. Jobbers everywhere putting it in because re-orders practically always follow first trial.

Perfection Pump Packing is a heavily graphited long-fibre packing. No granulation. No clogging or wearing of rods. Spools as shown in all usual sizes.

Ask your jobber or write us for information and for a convenient source of supply.

Advance Packing & Supply Co.
66 E. Lake Street
Chicago, Ill.

Pac. Coast Distributor: Allied Industries, Inc., San Francisco, Los Angeles, Seattle

WHY
experienced automobile mechanics prefer the
EVER-HOLD
ONE PIECE—quick
ADJUSTABLE HOSE CLAMP



BECAUSE—

there are ten good reasons:

1. They are assembled, rolled up and ready to apply.
2. They have no surplus length to cut or break off.
3. They can be made smaller or larger.
4. They take only a few seconds to apply or remove.
5. The nut and bolt never has to be removed.
6. The nut and bolt is riveted together to prevent loss.
7. They are made of high-grade steel or brass.
8. They are rust-proof, practical and unbreakable.
9. Two sizes are all that are needed in the garage.
10. They are guaranteed by the Vitek Mfg. Co., of Omaha, Nebr.

The pioneer manufacturers of high-grade, one-piece, quick adjustable hose clamps that are used the world over.

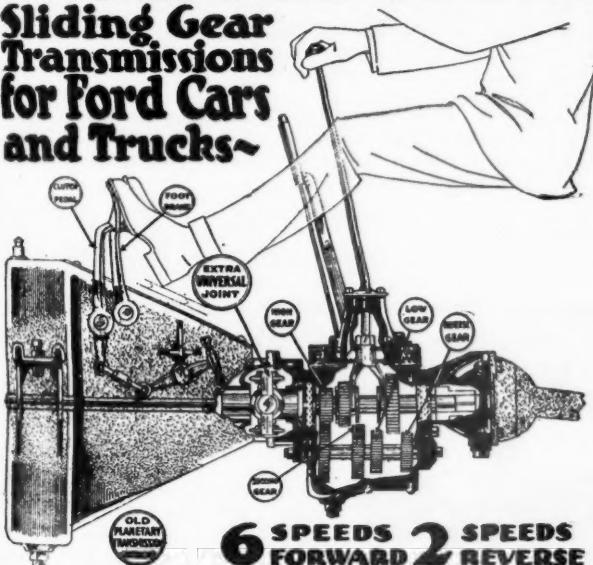
VITEK MANUFACTURING COMPANY

Industrial Bldg. Omaha, Nebr.

NOTICE TO DEALERS: The jobber with Ever-Hold hose clamp. If not, write direct to us. There is money in selling our clamps—besides they sell fast and none of them come back.

MOHAWK

Sliding Gear
Transmissions
for Ford Cars
and Trucks~



6 SPEEDS FORWARD 2 SPEEDS REVERSE

Converts the Ford car or truck into a standard machine with selective type gear shift, 3 Speeds Forward and One Reverse or 6 Speeds Forward and Two Reverse at driver's option. The MOHAWK can be installed with ordinary tools in six hours. It eliminates planetary trouble. Increases speed and power. It is GUARANTEED FOR LIFE OF CAR OR TRUCK. Write for full description and prices. DEALERS: Ask about territory still open.

The Mohawk Corporation. Dept. M, Rockford, Ill.

SEMI-STEEL REPLACEMENT PISTONS



For replacement work after a re-bore or re-grind job insures your customer as good if not a better job than the original assembly.

Dall Pistons are simply GOOD Pistons, made to manufacturer's specifications, sometimes more refined in design and lighter in weight, but always as carefully made and inspected as though they had to pass the most rigid inspection of a Motor Manufacturer.

Dall Pistons are regularly furnished in standard and various oversizes, also semi-finished 1/16 oversize.

Write today for price list and delivery schedule on all items. Distributors at various points will take care of your requirements.

THE DALL MOTOR PARTS COMPANY

Post Office Station D, Cleveland, Ohio
Southwestern Branch
THE CARROLL CO.
2218 S. Harwood St., Dallas, Texas

Stop Scraping Motor Bearings by hand—use the Elk Machine

100 per cent bearing in 15 minutes. Wrist Pin Bushings Reamed in perfect alignment. Forces out Wrist Pins. Tests squareness of Wrist Pins and Pistons. The most important Labor Saving Tool in shop equipment.

Send for Circular-Bulletin

Elk Machine Tool Corporation

243 West 17th Street New York

PAROB EXPANSION HAND REAMER

BLADES CUT AT
DIFFERENT ANGLES

Each successive blade cuts AT A DIFFER-
ENT ANGLE
from the one
before it.

No CHATTER,
no DIGGING IN—
even in keyed holes.

TWICE the expansion of others. All
sizes. Money-back guarantee.

Ask about the GAMMONS TAPER PIN
REAMER—Wonderful Time-saver.

THE GAMMONS-HOLMAN CO.
Manchester, Conn.

Dept. C.



PARANITE CABLE

Best for Automotive Work

We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought PARANITE Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.

FOR 33 YEARS THE STANDARD
IF IT'S PARANITE, IT'S RIGHT
Quality jobbers handle quality cable—
that's PARANITE.



Indiana Rubber & Insulated Wire Co.

810 Marquette Bldg., Chicago
Factory and General Offices—Jonesboro, Ind.



TRADE MARK
Waukesha
BUS and TRUCK MOTORS

A Better Motor

The development of this new Waukesha Bus and Truck Motor is a long stride in "heavy motor" efficiency. Its low operating costs builds bigger profits. Write for details.

The Waukesha Motor Company
Waukesha, Wisconsin



Don't Let Your Sales Helps Gather Dust on the Dealers' Shelves

We have worked out a dealer help proposition that is automatic in its workings. A dealer help proposition that does not depend on the initiative and judgment of the individual dealer to make the best use of the advertising literature you send him—literature painstakingly prepared at considerable expense.

Under this arrangement you keep the control at all times. You get the full power out of the advertising you have prepared. The dealer's expense because he is relying on you will be cashed in on the results. The campaign can be started or stopped promptly. It is flexible and selective. Best of all it is effective and it is inexpensive. If you sell to consumers through dealers you will be interested in this plan. Let us tell you about it.

SEND FOR THIS



Interesting free booklet "Automotive Markets and How to Reach Them" telling of various means for developing your business. It tells of our various automotive lists and statistics; our merchandising, advertising and mailing services. They save you money and they make you money. Investigate.

The Reuben H. Donnelley Corporation Chicago New York



Re-Babbitted Bearing Exchange

Our Re-babbitted Bearing Department is over two years old. Over 200,000 Con. Rods have been shipped. Less than one to each 2,000 have been returned as faulty. We have over 5,000 SATISFIED DEALERS in 16 States. We Re-babbitt ANY Bearing that has ever been Babbitted. Special undersize for Re-ground crankshafts 10 per cent extra.

A few of our LOW RETAIL PRICES are:—Marmon and Studebaker \$4.00. Chalmers and Moline Tractor \$3.50. Buick and Maxwell \$3.00. Oakland and Olds \$2.50. Fordson and Dodge \$2.00. Fords 60c each. Liberal Discounts to Dealers and Garages. We pay Transportation one way. RUSH Orders shipped same day order received. Satisfaction guaranteed.

Fremont Foundry & Bearing Works
1340 W. 5th St., Oklahoma City, U. S. A.

WHEN ALL advertisers demand their money's worth, all publications will provide circulation reports verified by the Audit Bureau of Circulations.

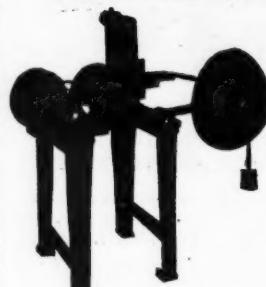
It is one of the mysteries of the advertising world that while all manufacturers demand verification of weight and quality in the material purchased, some of them still buy advertising space without knowing what they are paying for.

Such advertisers, however, are now exceptional. Most of them demand verified A. B. C. circulation statements before placing contracts.

In the case of MOTOR AGE, the demand is immediately met.

It is a member of the Audit Bureau of Circulations.

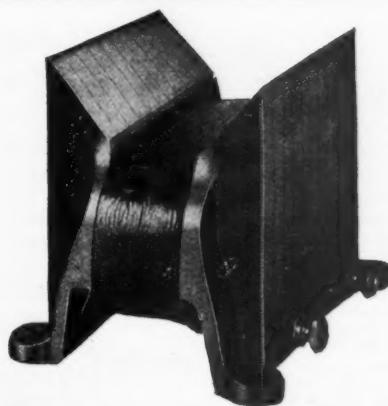
MR. RADIATOR REPAIRMAN



Make your own radiator cores and save 20% to 50% of their cost, give your customers quick service and a better core for less money. No need to carry large stocks of cores, and no damage in shipping. Increase your volume of business. Send for illustrated booklet describing our radiator core equipment.

Write for information to

Radiator Engineering Co.
626 Nesselwood Ave. Toledo, Ohio



This Growler Costs But \$4.50

With it you can tell in ten seconds whether an armature is in good condition. If it is not, you are saved all the grief of having to do the whole job over, losing all your profit and the customers' goodwill besides. Operates on 110 Volt A. C. Current.

Sold direct or through your jobber. Resale price \$4.50 in Central and Eastern States, \$5.00 in Pacific States. Your check for above amounts plus twenty-five cents postage brings this moneymaker to you.

ARMATURES: We rewind any and all kinds of GENERATOR, MOTOR and MAGNETO armatures, and reship same day old armatures received.

FORD GENERATOR AND MOTOR ARMATURES..... \$ 1.50

ALL SMALL DOUBLE UNIT GENERATOR AND MOTOR

ARMATURES.....

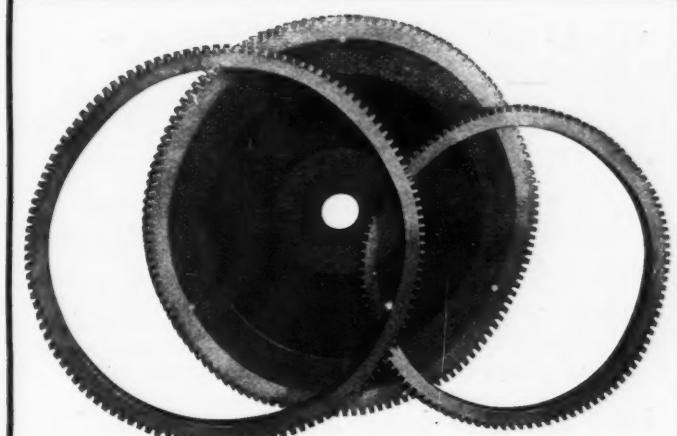
5.00

SINGLE UNIT MOTOR GENERATOR ARMATURES..... 10.00

MAGNETO ARMATURES..... \$3.75 to \$4.75

Armature Rewinding Co., Inc.

3301 Washington Blvd., St. Louis, Mo.



New Low Prices On Fly Wheel Rings

Increased quantity production has enabled us to get out a new and lower price list on Meachem Steel Gear Rings for Fly Wheels. Also our trade discounts have been increased to more than offset the lower list prices. Write us for the new list and discounts.

The Meachem Gear Corp'n.

Ring Dept.

Syracuse, N. Y.

Is Your Battery Business Paying?

If it isn't, it will be worth your while to investigate the Dragon franchise, because Dragon dealers, without exception, are making money and building a permanent business.

Write or wire

Englert Manufacturing Co.
Pittsburgh, Pa.

Dragon Storage Battery

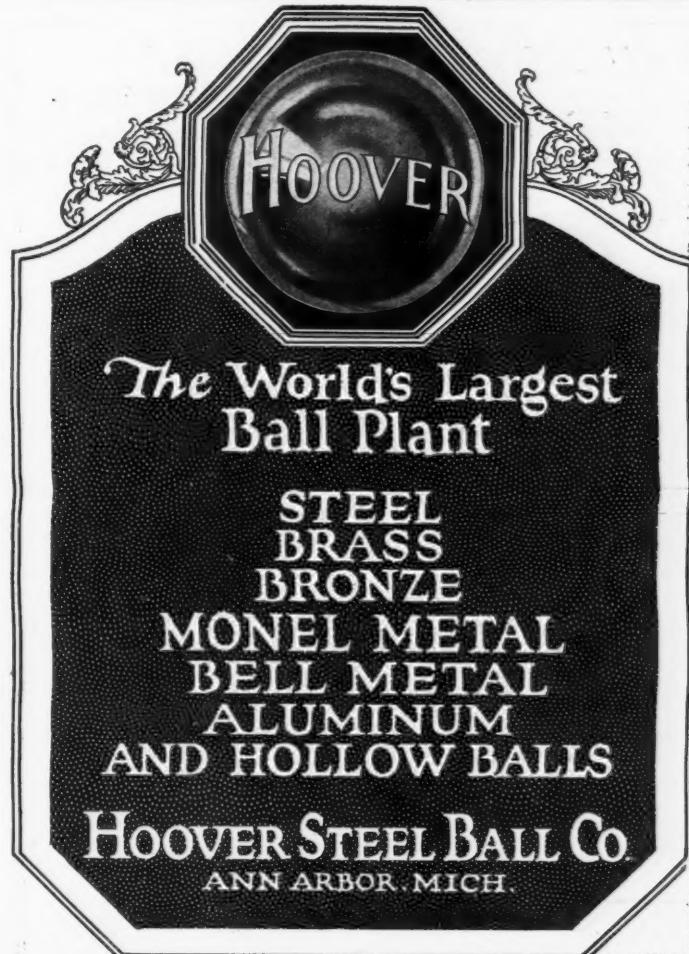


ANCHOR Automobile Lamps

You profit more by selling Anchor lamps. Seven years of close study and experience is in their design. The materials in them are the best the market affords. They give good, long service without complaints or make-goods. Our low manufacturing and selling costs allow you to make an extra margin of profit.

A sufficient stock of Anchor lamps requires small investment, and is cleaned out quickly by the constant demand. Jobbers and dealers both make money on the trouble-free Anchor line. Send for size and price lists with generous discounts.

ANCHOR ELECTRIC CO.
557 W. JACKSON BLVD. CHICAGO, ILL.



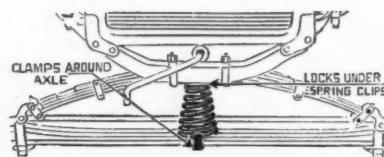
**Absorbs the
SHOCK
Saves the
SPRING**

Every Ford owner wants one and won't be happy until he gets it.

Retail Price **\$4**

Liberal Discount to DEALERS
Manufactured by

ARG Auxiliary Spring Co., Inc. Birmingham, Ala. Dept. 4



**ARG Auxiliary Spring
Protector for Ford Cars**

Makes riding easy. Prevents broken springs and leaking, racked radiators. Keeps tires from being cut by fenders and makes them last longer. For both single and double-clip Fords.

TRUSKO'S 11 Points

TRUSKO
Brace for
Fords

Patented;
other patents pending

Ask us about the other 10.
LIST PRICE \$2.50

The TRUSKO, Inc., Napa, California

**Let "Armature Winding Specialists" Relieve
You of Your "Rewinding" Troubles**

Our prices insure your profit.
Fords \$1.95, others in proportion.
Write for them. Quality and
service—all work guaranteed. Re-
wind armature shipped same day
defective one is received.

Capacity 1,500 a Day

H. M. FREDERICKS CO., LOCK HAVEN, PA., U. S. A.



Send For Our

NEW PRICE LIST

Our new catalogue just off the press gives reduced prices on our reliable line of battery plates and parts. You can now get these high-quality plates at about the same price as ordinary plates. You can guarantee our products, and your guarantee will stand up.

GENERAL STORAGE BATTERY CO.
2005 Locust Street, St. Louis, Mo.

**EXACTING TESTS HAVE PROVEN
RUBYFLUID SUPERIOR**



A complete substitute for dangerous acids, Zinc Chloride, Salammoniac and other mixtures commonly used as a Flux. Ruby Fluid is quick acting, anti-rusting and is always ready for instant use. Ruby users include the foremost industries of the country.

Send for generous Free Sample.

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TRADE MARK REG.

COMBINATION
SOLDERING AND TINNING FLUX

For All Metals
THE RUBY CHEMICAL CO.
68-70 McDowell St. Columbus, O.

INSIST UPON



Over a
Million
In Use

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MADE OF
CELORON

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JARVIS WATER INDICATOR



Prevents trouble due to lack of water. Warns of
other danger before it grows serious. When the
water gets low so does the red spot. When the
water boils, the red spot jumps. Only one moving
part. Moderate price, large profit, easily
sold. See the Jarvis Water Indicator on the new Maxwell
Sport Model. WRITE FOR PROPOSITION.

W. B. JARVIS CO. Grand Rapids, Mich.

**ARE YOU LOOKING FOR A
REAL BARGAIN?**

Watch the classified advertising columns of MOTOR AGE and you'll see many of them. Often a man has goods for quick disposal and he announces the fact here. Whether or not you are in the market right now for certain things you will find it pays to look over the classified ads every time you receive your copy of the paper. It's a good habit to get into and some day you'll be mighty glad of it.

Get the Habit—

**READ THE CLASSIFIED ADS
IN MOTOR AGE**

R&V Knight

SIX

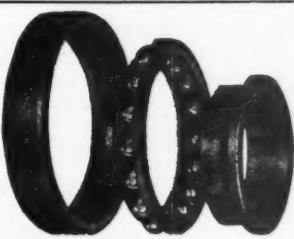
"EVERLASTING PERFORMANCE"
Engine Sealed and Guaranteed for 2 Years

R & V MOTOR COMPANY

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BRUNNER
AIR COMPRESSORS

"Good for Twenty Years at Hard Labor"
BRUNNER MFG. CO., UTICA, N. Y.



Angular Contact Radial Bearings
Angular Contact Thrust Bearings
Thrust Ball Bearings
"Star" Ball Retainers

The Bearings Company of America,
Lancaster, Penna.

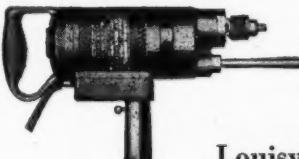
Western Sales Office,
1012 Ford Bldg.,
Detroit, Mich.



**With Only City Gas as Fuel
No Forced Air Blast
The No. 101
JOHNSON Bench Furnace
Has Proven the Best
For
Any Bench Work Requiring Heat**

JOHNSON GAS APPLIANCE CO.
Cedar Rapids, Iowa

**Get This "Pioneer"
Garage Special**



Electric Drill
and Valve Grinder

Greatest time and money saver,
as well as money maker, for
your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co.
Incorporated Louisville, Ky., U. S. A.
C. E. Willey, Pres. J. B. McFerran, Secy. Treas.

**Make the Big Money in
Fall and Winter Overhaul Jobs**

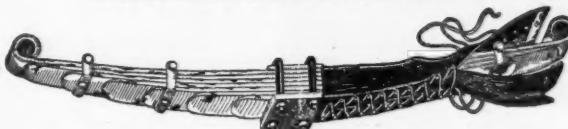
Cylinder renewing offers the
big money in fall and winter
overhaul jobs. Are you equipped
to keep this profit yourself?—
or must you let it get away to
others?

Stormizing Machines
Will handle all your cylinder
renewing. Will add a big profit
to your winter shop jobs. Look
into this better method of cylinder
refinishing. Send today for
our book: *Modern Cylinder
Methods*.

STORM
MANUFACTURING CO.
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DISTRIBUTORS WANTED



For National Automobile Spring Lubricating Covers

Now is the time to sell them—Winter's snow and ice and frozen roads are hard on exposed, unprotected springs. The NATIONAL is a grease cover, the grease being absolutely retained in the cover by patented felt pockets. This is an exclusive feature found only in the NATIONAL. Only best quality materials are used in manufacture.

Car dealers and distributors—let us give you our proposition.

NATIONAL AUTO SPRING COVER CO.
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FORD OWNERS

CAN NOW HAVE THREE-SPEED Transmission

This transmission has three speeds forward and one reverse and replaces the regular Ford transmission, drums, bands and all. The low gear is lower than the Ford, therefore more power, third or high is the same as the Ford high and second is halfway between.

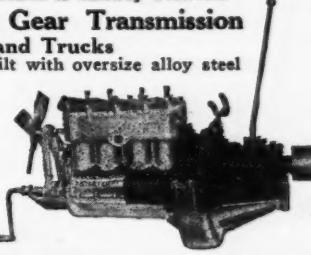
Cronk Simplex Sliding Gear Transmission

For Ford Cars and Trucks

This transmission is ruggedly built with oversize alloy steel gears. Multiple disc clutch. Foot brake on jack shaft outside of case. Hyatt Roller and Genelite bearings. Installation easy. No cutting or machining.

Write today for other interesting details.

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140 Hotel St., Utica, N. Y.



ARMATURE REWINDING

One Trial
Makes You
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Work and
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Guaranteed

Note Our Prices

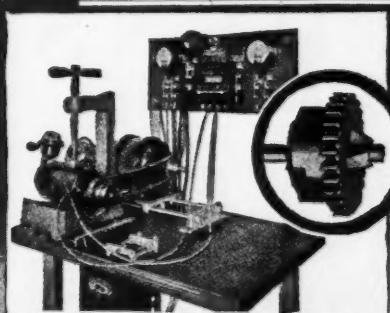
Generators, all makes	\$3.25
Liberty Fords	\$1.50
Starting Motors	\$1.50 to \$ 7.00
Motor Generators	\$5.00 to \$12.00

Our stock of 2000 armatures, for exchange
purposes, insures good service.

A trial order will convince you of the merit of our work
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With the Positive Drive and Speed Control



INCREASE YOUR PROFITS!

Starting, lighting and
ignition pays bigger
profits than any
other branch of
automotive service.

**The Exelsior
Test Bench**
equips your shop complete
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Price \$385.00
Payable \$50 per month
Write for bulletin 975M

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Distributors—Dealers—Agents
One of the best sellers in recent
years. Eliminates all eye strain
from oncoming headlights, sun glare,
and road glare.

THE OPTOSHIELD
Made of sapphire blue scientifically
made optical glass. Driver looks
right through it. Fits any windshield.
Price \$3.50. Write for proposition.
DETRO SALES SERVICE CO.
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ALUMINITE Pistons

Replacement for ALL MAKES of motors. 5
TIMES stronger than die-cast. Can't score,
pump oil or slap. Used 90 per cent racing cars
past 9 years. Special 12 oz. for racing Fords.
Aluminite Connecting-Rods, too. Get price list
and DISCOUNTS.

GREEN ENGINEERING CO., Dayton, Ohio



Lamps and Accessories

A quality group of fast selling items
for every automotive requirement.
Organized to supply the jobber and
dealer exclusively.

THE CINCINNATI VICTOR CO.
714 Reading Road
Owners, by purchase, of the Jobbers' Division of the Corcoran-Victor Co.

Cincinnati, Ohio

DUESENBERG
The Original Straight-Eight
With Four Wheel HYDRAULIC Brakes
INDIANAPOLIS, U. S. A.



IT'S EASY TO SELL

"The only oil ring with a
mileage guarantee"

"Sav-Oil" is stamped on bottom of every ring
The Sav-Oil Ring Mfg. Co.
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There is a Harvey
Steel Disc Wheel in
the various styles
which we make for
each size of car at
interesting prices.



Rim & Wheel Co., Inc.
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FRONTENAC CYLINDER HEADS and FRONTY-FORDS



The remarkable showing of the Fronty-Ford in the
500-Mile Race at Indianapolis May 30 was due
solely to the performance of the Frontenac Cylinder
Head. This Head is adapted for use on your Ford
car by its designer and builder, Arthur Chevrolet.
Write for FREE Catalog. Book, "How to Build a
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more.

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5
TIMES stronger than die-cast. Can't score,
pump oil or slap. Used 90 per cent racing cars
past 9 years. Special 12 oz. for racing Fords.
Aluminite Connecting-Rods, too. Get price list
and DISCOUNTS.

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ATLAS STEEL BALLS



Noted for Their Endurance in Service—The result
of Accuracy, True Sphericity, Uniformity of Com-
position and High Resistance Against Fatigue.

ATLAS BALL COMPANY
Glenwood Ave. at Fourth St., Philadelphia, Pa.



\$1500 to \$3000 A YEAR Easily Made Charging Batteries

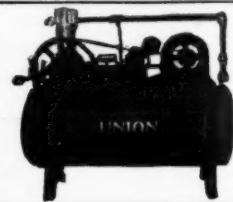
HB 8 Hour Constant Potential Battery Charger handles
double your present battery charging business with no in-
crease in space. Lowers cost of current, saves half on
labor. 8 hour service with HB Constant Potential outfit
eliminates competitors. \$30 monthly pays for outfit. 30-
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SPARE TIRE LOCK

Made by
JOHNSON AUTOMOBILE LOCK CO.
ST. LOUIS, U. S. A.



For Unusual Service

Union Air Compressor, Union for Ser-
vice, Union for Strength, Union for Re-
liability. Built by Union Equipment
Co., Butler, Pa. The best machine on
the market for the money.

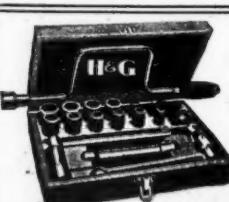
Union Equipment Company
Butler, Penn.

Welco Accelerator for Fords

Easily installed—one hole to drill.
Works independent of throttle. Any
engine speed by setting adjusting nut.
In colored carton complete with in-
structions. Write your Jobber.

Also makers of Welco Step
Plates, Gas Tank Caps, Blanket
Holders, etc.

The Welker-Hoops Mfg. Co., Middletown, Conn.



140 Combinations —all in this ONE set

Everything you need, in one small box, compact,
accessible, and a real mechanic's outfit. Sockets
will not break. Fully guaranteed. Ask your dealer
or write us.

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10-20 Barclay Street, New Haven, Conn.

Eight body types—\$1295—\$2250
STEPHENS
Finer Motor Cars  At Lower Prices



WRIGTH
MANUFACTURING
COMPANY
LISBON, OHIO
**HIGH SPEED
HOIST**

TAKE THE END-PLAY OUT!
—WITHOUT PULLING THE MOTOR
THE C. A. ADJUSTABLE CENTER BEARING CAP
corrects Ford crankshaft end play and sets magneto for
highest efficiency without removing the motor. Easily
and quickly installed. Guaranteed for one year. List
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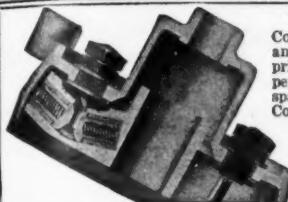
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ADJUSTABLE BEARING CO., Inc.
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WARNER GEAR COMPANY MUNCIE, INDIANA



CLUTCHES, TRANSMISSIONS, CONTROLS, DIFFERENTIALS



THE DOUBLE CONTACT TIMER
Combines the "wipe" and unfailing contact principles. Gives full, perfectly synchronized spark at all speeds. Contacts are positive.

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Twin Timer
FOR FORD CARS TRUCKS & TRACTORS

Kelso

BRAKE LININGS and CLUTCH FACINGS
Always used where safety and service are the first and only consideration.

KELSO M'FG CO.,

TRENTON, N. J.

Equip Your Shop

with
HOYT Electrical Testing Instruments

Burton-Rogers Co., Boston, Mass.



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WEL-EVER OIL CONTROL PISTON RINGS

Write for interesting circular on oil pumping and details about this fast selling piston ring.

THE WELEVER PISTON RING CO.
1713-15 Canton St. Toledo, Ohio

Less Oil and Gas—from WEL-EVER equipped units. Its oil control feature is guaranteed to stop oil pumping, prevent spark plug fouling and reduce carbon formation.



The COURIER

Nine body types,
from \$1,295 to \$2,195

THE COURIER MOTORS COMPANY
SANDUSKY, OHIO

Ask Us About Our Cylinder Internal and Surface Grinders

MONOGRAM LIGHT DISTRIBUTORS
Standard equipment on 114 of America's foremost cars and trucks.
Pass I. E. S. rules and all state tests

MONOGRAM LENS CORPORATION
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MICHIGAN

WAYNE REAMER



Double duty adjustable reamers. Set of seven, \$40. Made by TOOL-MAKERS. Circular. WAYNE TOOL MFG. CO. Waynesboro, Pa.

WITH
DETACHABLE
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Let us send you our FREE Catalogue on

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Gemco BUMPERs

Bumpers for all cars

The Price and
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Complete Catalog on Request
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ESTABLISHED 1885

ACCURATE MEASURING PUMPS

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Wedge-Rite piston rings are 3-piece rings following the best engineering practice. The patented wedge takes up the wear, keeping the groove and cylinder wall tight against oil and compression leakage. Wedge-Rite Piston Rings are made from the best individual castings. —
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Relio, an electric-drive wet grinder for pistons, pins, valves, bushings, \$475.00.
Valvo, an electric-drive bench grinder for valves, valve-seat reamers, \$175. See page ads this paper.
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Noiseless Timing Gears
Install quietness—Cloyes NOISELESS Timing Gears. They give the motor a soft, even "purr"—permanently.
Cloyes Gear Works
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Sales Representatives
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INTERNATIONAL MOTOR TRUCKS for low-cost hauling

Models range from the 2,000-lb. Speed Truck to the 10,000-lb. truck. Some territory is still open for dealers.
International Harvester Company of America
(Incorporated)
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THREE PRODUCTS YOU NEED
ZIP FRICTION PASTE, for fitting in bearings.
ZIP GRINDING COMPOUND, for valves.
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The Original Write For Samples Ask Your Jobber.
Water Mixed. THE ZIP ABRASIVE COMPANY Cleveland, O.
U. S. Pat. 1353197 THE ZIP MFG. CO. Denver, Col.

When It Rains—There is big business for the wise dealer who carries a select stock of
ADCO WINDSHIELD WIPERS
Clear Vision Adco Kleanall Clearsite Raino
A Type and Price for Every Customer
Write for descriptive literature on 76 Adco Products, giving your jobber's name
AMERICAN AUTOMATIC DEVICES CO.
502 S. Throop St. Chicago

bethlehem betterments
for Motordom
Utilities - Not EXCESSories!

The Francisco Auto Heater—

Made in 60 different models for all makes of cars—heats both closed and open cars. Gives from two to three times as much heat as any other heater.
THE FRANCISCO AUTO HEATER MFG. CO.
Columbus, Ohio

INSHIELD SPOTLIGHT
No Glass to cut—Inside the windshield.
Adjustable to all positions.
Two models—all nickel finish \$10.00. Two sizes, Senior model 5½" in diameter. Junior, 4½". Black enamel \$8.50. Junior size only.
Jobbers, Dealers, write for details.
Genuine Inshield Spotlight made only by
The Thal & Bitter Machine Company
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TIMING GEARS
A General Electric product. Made entirely of cotton fabric processed to wear like iron. Eliminates all noise from the timing gear assembly. For practically all cars. Write for prices.
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Automobile and Radio batteries charged for a nickel. Ten million car owners and five million radio fans are prospects for
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BIG PROFITS. WRITE NOW.
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FLOAT THE CAR ON AIR
Promotes smooth, joltless riding by cushioning all road shocks. Positive two-piston action against air pressure and oil. Easily installed and permanent in operation. Big profits for live dealers and distributors.
THE REID AIR SPRING COMPANY
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B. C. AMES COMPANY
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Taps, Dies, Cutters, Drills, Reamers
Send for Catalog
ALVORD REAMER & TOOL COMPANY
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WEAVER
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Cold-Drawn Sockets
ALLEN PROCESS MAKING A SOCKET
The Allen Manufacturing Company, Hartford, Conn.
ALLEN Wrench Sets

Side Wall Model Dash Insert

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ASH RECEPTACLE**
It Does Sell for Two-fifty. Get Some!

THE FARGO CO., Inc. 303 Watson St., Ripon, Wis.

Air Compressors; Gasoline and Oil Storage Systems; Heavy Metal Storage Tanks; Oil Burning Systems, Furnaces and Forges; Oil Filtration Systems; Water Softening Systems.

WAYNE TANK & PUMP COMPANY,
706 Canal Street, Fort Wayne, Ind.

Wayne

Better than a new flywheel
"Saves Money—Saves Delay"
For every American Car and Truck

EXCELSIOR STEEL RING GEARS
SPRINGFIELD MFG. CO.
Springfield, Ohio

ACE aligning gauge

An absolute necessity for squaring up pistons and wrist-pins with the crankshaft. Made to real tool-making standards. Complete with 10 precision ground bushings \$25.00, with 3 bushings \$20.00. Ford Special \$16.00. Send for circular. 30 days' trial if desired.

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52nd Street & Lancaster Ave., Philadelphia, Pa.

Mosler Spit Fire Plug
The Plug with the Red Top

Made in a line of 6 sizes only. Ford size at 60c each. Balance of sizes \$1.00 each. Assured profit and turnover for the dealer. Write.

MOSLER METAL PRODUCTS CORP.
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KOKOMO LONG-LIFE TIRES AND TUBES
KOKOMO RUBBER CO., Kokomo, Indiana
131 South Main St.

Kokomo Long Life tires and tubes make money for dealers who handle them.

Kokomo Twin-Grip Fabrics
Kokomo Two-Grip Cords
Kokomo Everlast Red Tubes
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NO-LEAK-O PISTON RINGS
Won't Leak Because They're Sealed With Oil

"NO-LEAK-O" Because They're Sealed With Oil
PISTON RING
PISTON RING CO., Dept. T-57, Muskegon, Mich.

Be the local Logan Man — Let us show you how easy and how profitable it is to install Logan Ring Gears.

Kauffman Metal Products Co.
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AXLE SHAFTS and SPRINGS
Also Keys, Key Stock and Nuts for all makes of cars and trucks. Write us about Gilliam Bearings

BUTLER AUTOMOTIVE STEEL COMPANY
Easton, Pa. 101 D Street

The "UNEEK" and "OTIS" Hose Clamps
are in a class by themselves

OTIS-FLAGG CORPORATION
Main Office and Factory YORK, PENNA.

U.S. AXLES
Front wheel brakes are here!

This is the perfected front wheel brake equipment. Can be hooked up to conventional rear axle and transmission brake. Big car sales feature. Write.

U. S. Axle Co., Pottstown, Pa.

2-WAY HYDRAULIC SHOCK ABSORBER
More than a Shock Absorber because it fluid-cushions all movements between the body and the chassis—gives a new experience in riding comfort. Good distribution territory is still to be allotted. For information write to

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THE QUINCY SILENT AIR-MASTER
The Most Air Per Dollar Cost

WALL PUMP & COMPRESSOR CO.
Quincy, Ill., U. S. A.

CONNEAUT Plastic Metallic Packing

Patented

Stops the leaks in automobile water pumps. Mold it with your fingers. Makes a smooth metal bearing—adjustable and practically frictionless. At your Jobber—Get it today. It does the trick. Put up in 1 lb. cans. If your Jobber doesn't carry it, write us direct. Price \$1.65 per pound, f. o. b. Conneaut, Ohio.

The Conneaut Packing Company

Conneaut, Ohio

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Equalizers FOR FORDS

PUSH ON THE ROAD

AUTO SPECIALTIES MFG. CO., 579 GRAVES ST., ST. JOSEPH, MICH.

GARDNER
Motor Car

Valve Grinding Compound
The New Handy Can

Monarch Valve Grinding Compound, "The Quality Compound" since 1907, Packed in 4-oz. boxes—2-3 coarse, 1-3 fine—List 50c.

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KISSEL
The Custom Built Car

The Aristocrats of Motordom

7 Models—Open and Closed
Distributors in principal cities. Open territory now being closed.

Kissel Motor Car Co.
Hartford, Wis.

STERLING STARTING CRANKS FOR ALL CARS

Only complete line on the market. A crank for every car. Long profit for dealer. Write today for full facts.

Good territory open for salesmen.

STERLING PRODUCTS CORPORATION
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RED DEVIL

SELF-ALIGNING BURNISHING MACHINE
Makes it possible to fit over-size pistons without removing engine from the car when the variations do not exceed 5/1000 of an inch. Cylinders slightly tapered, out of round, or with shoulders worn by pistons or rings may be made round, straight and true. Price \$25. 12 ounce can Red Devil Compound, \$1.50. Write for complete details.

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Every Tungsten Spark Plug Sealed in a Metal Container

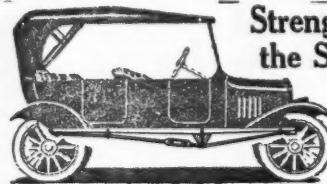
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WORLD'S STANDARD REPLACE-
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Prevent Costly Repairs. Distribute the Shocks. \$12 a Set—Parcel Post Prepaid in U. S. A. State Representatives Wanted
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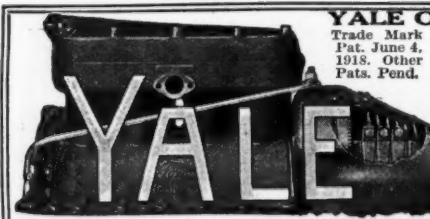
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Dent, M. Mobile, Ala.

Pat. May 1st, 1923

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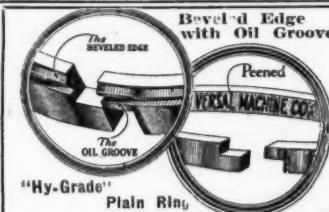
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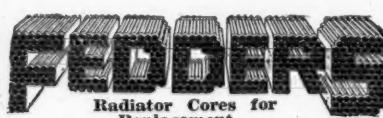
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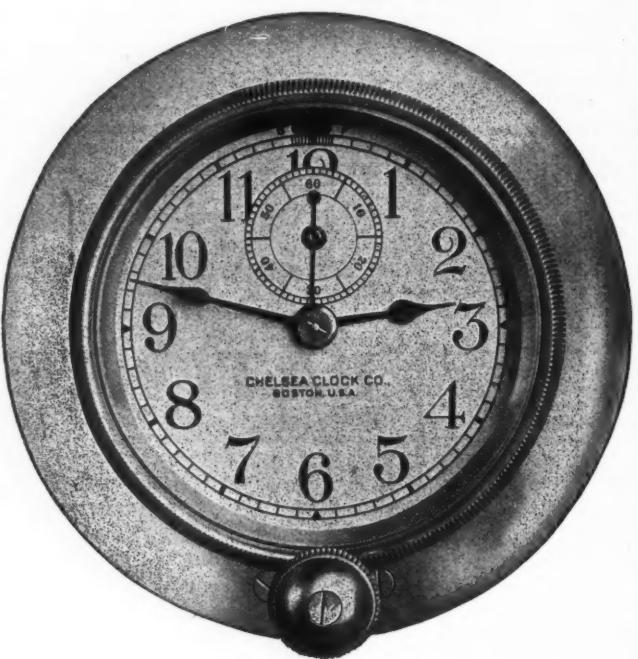
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We shall be glad to go into the matter in detail with you and prepare your copy if you wish.

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Snap-on

INTERCHANGEABLE
Socket Wrenches

Profit and Prestige in Every Page

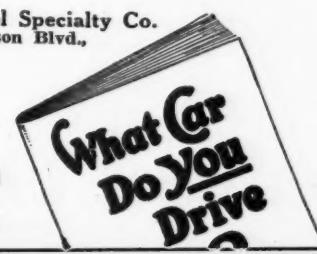
That's what's in this famous book for you! It lists every popular make of car and tells the right Snap-on socket to fit every nut and bolt on every car, and the right handle to snap on the socket to make the job easiest. Makes you a wrench expert without time or study—assures sales. Write TODAY!

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CHICAGO

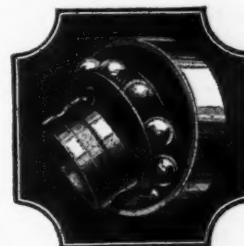
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Manufacturers
Milwaukee, Wis.

A Selected
Kit for
Every Car

"The Greatest
Service from the
Fewest Tools"



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Internationally recognized as
the standard bearings for
ignition apparatus and
lighting generators

THE NORMA COMPANY
OF AMERICA

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Long Island City
New York
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The Sign of
the Genuine



Are You Fooling Yourself?

Are you wearing yourself out on the treadmill of useless, profitless sales effort?

Are you linked with a manufacturer who hasn't a chance on earth of holding his own against the severe competition in the automobile industry?

Is there a millstone of financial burden around your neck, retarding your every step?

Isn't it high time to take stock of your situation: to quit fooling yourself and to analyze, frankly and honestly, your true condition?

Many an automobile dealer today finds himself at a complete standstill—facing the future with uncertainty, not because he isn't a wise merchandiser, but because the product he is selling and the manufacturer behind it are steadily losing ground.

If you are one of those dealers, we'd like to

ask you plainly, "Why handicap yourself with a loser? Wouldn't it be more profitable to associate yourself with an organization like Stutz whose success is here—whose future is certain?"

Stutz is growing and expanding every day. The success of the Stutz Six has swept the country. Sales are mounting rapidly at a time when others report a decline. Today shrewd dealers are flocking to the Stutz standard.

The foundation of Stutz is solid. It rests on powerful resources. Its progress is guided by those to whom failure is unknown. The Stutz franchise is as fair as any ever written. It insures a square deal all around, a permanent association, and is a certificate of profit to the dealer who holds it. Write or wire for particulars today. Your territory may be open.

STUTZ SIX

\$1995 to \$2550

STUTZ MOTOR CAR COMPANY of AMERICA, Inc., Indianapolis, Indiana
Builders of the Original and Genuine Stutz Motor Cars

GENUINE BLACK & DECKER PORTABLE ELECTRIC DRILLS

...be easily distinguished in three ways

This well known Black & Decker hexagonal trade-mark on the nameplate. This trademark is registered in practically every civilized country in the world.

2 The motor case is also hexagonal in shape corresponding with the trade-mark. This makes an exceptionally rigid case and the corners leave open spaces around the motor field making it possible to ventilate and cool the outside of the motor field as well as the inner circumference.

3 "The Pistol Grip and Trigger Switch" is thoroughly covered by mechanical patents preventing its duplication by others, although others have designed portable electric drills which have a handle and switch somewhat similar in appearance. The genuine "Pistol Grip and Trigger Switch" is used by us only, and in two styles as illustrated. The final test of genuineness is to operate the switch. The genuine Black & Decker "Pistol Grip and Trigger Switch" stays "on" or "off." It need not be held in either position. One pull of the trigger switches the current on, and it stays on until the trigger is pulled again, after which it stays off until again pulled. It is this feature which has made it so popular.



For your own protection we urge that you apply these three tests and satisfy yourself that you are getting the genuine article.

THE BLACK & DECKER MFG. CO.
Towson Heights, :: :: Baltimore, Md., U. S. A.

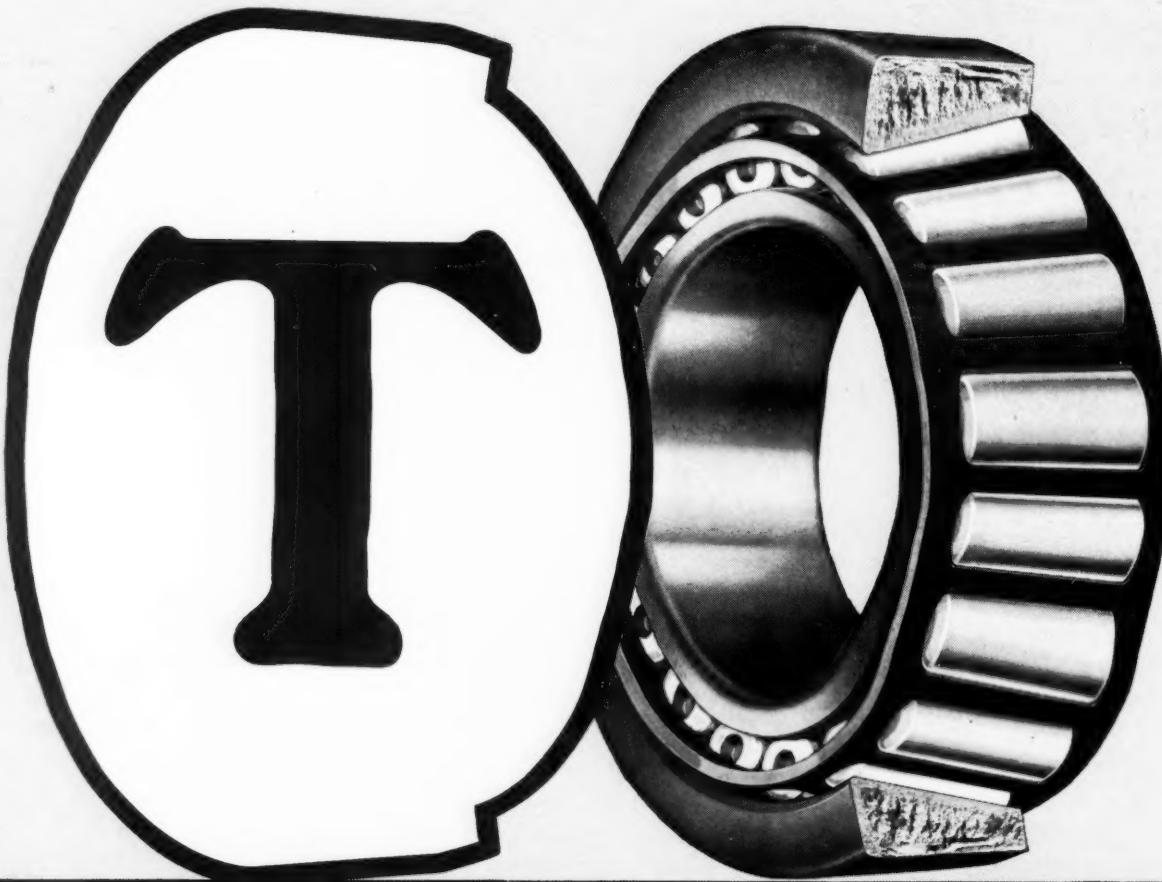
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Canadian Factory, Lyman Tube Bldg., Montreal, P. Q.



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